COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second-class postage paid at Framingham, Mass., and additional mailing offices ©1981 by CW Communications, Inc.

Vol. XV, No. 36 September 7, 1981 $1.25 a copy; $36/year

NEWSPAPER

Sales and Service

• DPers Knock Sales Hype, Look for Technical Savvy

By **Brad Schultz**
CW New York Bureau

DP managers want more straight talk and technical savvy from vendor salesmen. They also want assurance that products and services will fit their situations years after delivery.

Sixteen DP managers gave *Computerworld* that consensus in telephone interviews last week. Most expressed skepticism of vendor sales pitches. Some said user groups or "grapevines" are the only way to learn whether systems and software perform as vendors claim.

The 16 survey respondents run DP for six manufacturers, an insurance company, a trust company, a lumber mill, a retailer, a

(Continued on Page 4)

• Vendors Say Users More Sophisticated Today

By **Brad Schultz**
CW New York Bureau

DP managers are much more sophisticated buyers than they were several years ago. For systems implementation to succeed, vendors must sell solutions to user problems, not just "razzle-dazzle" technology.

That was the consensus of marketing managers for eight vendors interviewed by *Computerworld* last week in conjunction with the DP manager phone survey on vendor relations.

CW polled spokesmen for two mainframers (one plug-compatible), two minicomputer makers, two software houses and two communications suppliers. They

(Continued on Page 4)

Bell Sitting on Data That May Hurt Users, Modem Makers Say

By **Bruce Hoard**
CW Staff

One million users of low-speed, half-duplex modems for satellite transmission could be affected by propagation delays and echoes unless AT&T provides information modem makers need to alter their products, two independent modem manufacturers warned last week.

AT&T maintains it is providing all the necessary information modem manufacturers require and has made a conscious effort to publicize that information.

The controversy is based on Bell's plan to reroute large amounts of its Wats and Message Telecommunications Service (MTS) transmissions via a satellite link early next year [CW, June 1].

According to Bell's "Dear Customer" letters sent out in August 1980, Wats and MTS users can expect propagation delays and echoes if they use Bell 201, 202 and compatible low-speed modems. Full-duplex modems will not be affected.

Approximately one million users will be affected, according to the modem makers.

The common carrier also maintains it has publicized the information needed to adjust the Bell-compatible devices to compensate for the 46,000-mile satellite-to-earth round trip.

Charles P. Johnson, president of General Datacomm Industries, Inc., asserts that Bell is witholding information illegally in defiance of one of its tariffs. In addition, he claimed, AT&T is using the delay to provide its wholly owned subsidiary, Western Electric, with up to a

(Continued on Page 10)

Report Lets Secret Service DP Off the Hook

By **Jake Kirchner**
CW Washington Bureau

WASHINGTON, D.C. — Even massively upgraded Secret Service DP resources would not necessarily have helped the agency avert the assassination attempt on President Reagan last spring, a Treasury Department report has concluded.

The report stems from a Treasury review of the department's performance following the March 30 shooting at the Washington Hilton. John W. Hinckley Jr. was indicted for the assassination attempt by a federal grand jury here recently.

The inquiry focused in part on established operating procedures of the various Treasury agencies and on the Secret Service in particular. The Secret Service, the inquiry found, is not using its full DP capabilities to protect the President and other government VIPs.

The review, issued Aug. 19, produced no specific complaints about the Secret Service's security operations or its handling of the March crisis. However, the report did conclude that the agency could better use DP power and statistical analysis methods to assess the general "dangerousness" of protected persons' environments.

Treasury also said the Privacy Act and the Freedom of Information Act have greatly restricted Secret Service access to data files of other federal agencies. The laws have also dangerously constrained the service from gathering information from institutions such as hospitals, banks and telephone companies, the report said.

Treasury suggested "consideration be given to narrowing the scope" of the two

(Continued on Page 6)

ELECTRONICS UNDERWORLD

Trail of Stolen Intel Chips Leads to Siemens

By **Christopher Simpson**
Special to CW

SANTA CLARA, Calif. — John Henry Jackson was a happy man during the summer of 1979. His California electronics shop was doing quite well. He wore fine clothes, ate the best foods and lived with a beautiful woman.

Not bad for a man who had been convicted five times on felony charges.

On warm summer nights, Jackson remembers, he would flop his tall, lanky frame down behind his kitchen table and count out his money. It arrived via express delivery at San Jose Airport in stacks of crisp $100 bills.

Sometimes $350,000 would come neatly packed in cardboard boxes. Sometimes it was $400,000 or more. The exact figures are hard to remember, he said, because no records were kept.

Jackson now admits that during 1979 he was one of California's biggest dealers in stolen microcomputer chips, the hottest new black market product since cocaine. One of Jackson's biggest customers, California law enforcement officials charge, was Siemens AG, the powerful West Germany-based electronics company whose annual trade is measured in the billions of dollars.

According to court documents on file in several cities, Jackson was a crucial link in a five-step process that brought sophisticated, stolen Intel Corp. 2732 chips to Siemens' supply shelves. Siemens now admits that it purchased microcomputer chips traced to Jackson, but denies knowing they were stolen and denies having any contact with Jackson. Siemens aided in the investigation by providing information, according to Dr. Gernot Oswald, the marketing chief for Siemens' integrated circuit division in Munich.

But some U.S. law enforcement officials remain unconvinced about Siemens' professed innocence."I'm sure Siemens understood what they were getting into," commented Wayne Brown, the Santa Clara County sheriff whose undercover work helped break the case. "If I was them and some low-rent company from Los Angeles came along with five times

(Continued on Page 8)

Wide World Photo

Who's Your Favorite?

Football season is back and so is Bud Goode, the intrepid, computerized pro football prognosticator. He's predicting that one of the teams shown above will fashion a repeat appearance in Super Bowl XVI. Story on Page 7.

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Second-class postage paid at Framingham, Mass., and additional mailing offices PN127420. *Computerworld* (ISSN-0010-4841) is published weekly, except: semiweekly the third week in March, the first week in September and a single combined issue the last week in December and the first week in January by CW Communications/ Inc., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

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$1.25 a copy: U.S. — $36 a year; Canada, Central & So. America — $65 a year; Europe and Near East — $125 a year; other foreign — $175 a year (airmail service). Four weeks notice is required for change of address. Please allow six weeks for new subscription service to begin.

Computerworld can be purchased on 35 mm microform through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. *Computerworld* is indexed: write to Circulation Dept. for subscription information.

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, Circulation Dept., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

U.S. Customs Turns Off Terminals to See If Multimillion-Dollar System Worth It

By Tim Scannell
CW Staff

SAN DIEGO — The U.S. Customs Service shut down its multimillion-dollar law enforcement system for a month at five of the country's busiest border crossings to find out if the system was worth the money.

The jury is still out.

From Aug. 1 until early last week, inspectors at primary inspection stations leading from Mexico and Canada into the U.S. ignored computer terminals installed at each of these locations and relied on manual checking methods to screen people entering the country at the borders.

For the most part, the manual checks consisted of agents depending on their "training and experience" and "professional ability" rather than the resources of Custom's Treasury Enforcement Communications System (Tecs), according to Robert Schenarts, manager of the computer-based program.

Just Luxury?

Presently, Custom's officials are reviewing results of the one-month computer abstinence to see if the system, estimated to cost the government about $8 million per year, is an effective law enforcement tool or just an operational luxury.

At the moment, officials feel that operations at each of the border crossings were not impaired by the computer's absence.

Tecs is a worldwide law enforcement information network consisting of about 1,400 terminals that are linked via leased lines to twin Burroughs Corp. 7700 mainframes here. The tightly configured on-line system operates 24 hours a day and contains data on known customs violators, fugitives and suspected felons.

As part of its network activities, the system can also communicate with the Federal Bureau of Investigation's National Crime Information Center computer system and other computer-based crime tracking systems, according to Lou Cegala, director of Custom's Law Enforcement Systems Division.

Working Without System

Turning off the system at the five key entry points "was essentially a test of working without the computer as opposed to working with it," Program Manager Schenarts said.

"The computer system does not do the job, the computer system does not tell the inspector that a car is clean and can go, it only provides him with whatever information is in the computer base. The inspector is the prime functionary, not the machine," Schenarts insisted.

Locations that took part in the system shut-down were selected by Custom's Office of Border Crossings on the basis of the type of activity and size of the port, he said.

While the test was primarily run made to evaluate the system's operational effectiveness, Custom's officials are also looking at it from a cost savings angle.

"There are always budget considerations," Schenarts noted. "We take anything we do at one point in time and try to look at it and see how it's operating and whether it's the way we want to go. This was just one of the things we chose to look at at the time."

James Peacock, 44

James Peacock, senior vice-president of planning for International Data Corp. (IDC), died Aug. 23 in Provincetown, Mass., of complications related to cancer. He was 44.

Peacock was a 15-year veteran of IDC, *Computerworld*'s sister company under International Data Group. He started as managing editor of IDC's "flagship" newsletter, the "EDP Industry Report," in 1966. Prior to joining IDC, Peacock was the Boston bureau manager for McGraw-Hill.

He graduated with a degree in applied mathematics from Georgia Institute of Technology in 1958, after which he served in the U.S. Navy.

During the ensuing years, Peacock's work as a journalist and thinker helped clarify — for both his readers and his peers in the press — the issues and events that have shaped today's $50 billion information processing industry.

As early as 1972 he was predicting the "nameplate" generation of computers, typified by today's modular, field-upgradable central processing units, data base machines and communications processors. His analysis of the early time-sharing industry led IDC to generate its definitions of the processing services market — definitions still widely used in the industry today.

This Week

THE HISTORY OF COMPUTING — Part 6 33

IN DEPTH
Capacity Planning . . . . Follows Page 58

NEWS
Why Did Hinckley Go Unnoticed? 6
Goode Picks Eagles in Next Super Bowl, But... 7
La. Medicaid Processor Fined for Third Time 11
Study Sees FBI's CCH Alternative in Jeopardy . . . 12
Arsonist Torches DP Site While Backup Down 13
Warden Blames Computer for Escape of Cons 14
To Halt Turnover, Show Them You Care: Exec . . . 15
Workshops Planned for Middle, Senior Officers . . . 16
Study: Split Public, Private Information Roles 17
Vista Installing System to Combat Fraud 19
William Sanders: The Right Place, Right Time 22
Texas Landlords Tracking High-Risk Renters 24
Flexibility Proves Key to Microdata Reality 4000 . . 28
Boston Pursues Parking Offenders 29
Study Launched on Home Information Systems . . . 30
Henry Thoreau Behind a Buick Skylark? 32

EDITORIAL
Editorial: The DP Mystique 40
Editorial: New Opportunities 40
Softline: Economic Trade-Offs in Software 41
Human Connection: Gustatory Glitches 41
'As the Disk Turns' to Create Suds on TV 42

SOFTWARE & SERVICES
Ada Compiler Built for Commercial Sites 45
'Abend-Aid' Tailored to DOS/VS, VSE 48
Management Facilities Update 'DOS/Look' 49
'Pascal-2' Fits Existing Libraries 50
Portfolio Accounting Aims Wang Minis 52
Two Software Products Out for HP 3000 53

COMMUNICATIONS
Major Battle Brewing Over Wideband Dems 57
Mux Introduced for 3274 Controller 58

SYSTEMS & PERIPHERALS
Insurer Decides to Ensure DP Operation 59

MINIWORLD
Zilog Says Micro Beats PDP-11/70 61
Tape Subsystem Runs IBM-Format Tapes 63
Printer Runs 300- to 1,500 Line/Min 65

OFFICE AUTOMATION
WP Report Put Smile on Realtor's Face 67

COMPUTER INDUSTRY
National Semi Bursts Bubble Operation 69
Two More DG Execs Call It Quits 69

ADVERTISING INDEX 112

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DP Managers Skeptical of Vendors' Pitches

(Continued from Page 1)

food processor, a dairy, a winery, a transportation company, a firm in entertainment and a state agency. The DP executives named 10 different vendors as their prime sources for large-scale systems.

Complaints about "too much sales literature for us to digest" was voiced by the DP directors of Twentieth Century Fox Film Co., Ernest & Julio Gallo Winery and Chicago-based Edward Hines Lumber Co. Product information tends to be inaccurate, added Management Information Systems (MIS) Director John Coleman at Iowa Processors, Inc. in Dakota City, Neb.

Sometimes, Coleman said, a product is only planned for release when a vendor salesman describes it as existing. As a rule, Coleman asks a salesman to provide customer lists for a product under consideration.

But dissatisfied customers may not appear on lists salesmen do provide, so Coleman relies on personal users contacts to get the lowdown.

So does MIS Director Linda Philipps at the Admiral Division of Magic Chef, Inc. in Schaumburg, Ill. A home appliance manufacturer, Admiral depends on turnkey systems bacause it lacks resources for software development and much maintenance, Philipps told CW.

Rather than draw up a sales contract, Philipps prefers to tell the salesman "as long as you make me happy and my users happy, I will be a valuable customer reference for you." Admiral has "an excellent vendor relationship," she maintained.

At SCM Corp. in New York, Systems Manager Michael Schultz observed that "a good product sells itself." He prefers a "rap session" approach to articulating what he wants from vendor representatives, calling "rapport" and interpersonal "chemistry" essential to a successful vendor relationship.

At SCM, Schultz asserted, vendors waste their time by sending salesmen who lack technical understanding of products. When a salesman responds to a technical question with "Well, let me write it down and I'll get back to you," Schultz gets suspicious.

At Munford, Inc. in Atlanta, MIS Director Charles Dickson also complained about "salesmen who don't understand their products." Michael Trevor, who runs DP for much of Montana's state government, said his giant, diversified systems supplier had overly fragmented representation in terms of technology.

The systems supplier divides the expertise of its sales force into mainframe, communications and office products divisions, Trevor explained. So no single salesman can discuss the "total system" needed by the Montana Administration Department, he indicated.

According to Trevor, maintenance service availability is a vexing problem for the state agency because of its distance from major cities. In Honolulu, the computer center director for Bishop Trust Co. reported that most U.S. systems vendors have no local representation.

Few Choices

That means Robert Keim has few choices in shopping for a system. His current supplier was described as moving too fast into the future with its product offerings. Bishop Trust needs technology a few years behind the state of the art, Keim told CW, but the company's supplier has cut support for all but the latest in systems and peripherals.

Bates Fabrics in Lewiston, Maine, has another kind of remoteness problem in securing what it needs from vendors, according to DP Manager Robert Eldredge. The textile manufacturer cannot find software packages designed for textile industry applications. Its remoteness from the heartland of manufacturing software has led Eldredge to desperate searches for packages other textile companies have written in-house.

'Razzle-Dazzle' Lost on Savvy Users

(Continued from Page 1)

were asked: "What problems do you encounter in getting to understand what a prospective customer wants?"

Mainframes are sold in three basic ways, two of which pose special problems, according to Robert M. Tanner, Honeywell, Inc.'s director of Large Systems Marketing.

First, mainframers sell to the "established customer" in an atmosphere of rapport and little competition, Tanner explained.

Not so easy is the second way to sell mainframes: in competition with other vendors in a request for proposal (RFP) process, the Honeywell executive continued. This can be a "cold, antiseptic environment," he added.

The RFP "is a strong attempt to tell the prospective vendor what to do. Some users are pretty good at it," Tanner observed. Somtimes, vendors have difficulty understanding RFPs.

The third way to sell mainframes is dying out: the aggressive "knock on doors" approach in which salesmen try to stir up business. Most potential customers have well-established DP departments, formal procedures for procurement and longstanding ties to one vendor or another — factors discouraging to door-knocking salesmen.

Magnuson Computer Systems, Inc. is a plug-compatible mainframe manufacturer, selling hardware designed to drive the software normally sold for certain IBM processors (the 4300 family). According to Magnuson's product marketing manager, Bruce Moore, the Silicon Valley-based vendor's chief problem in wooing potential customers is how to establish a feeling of partnership between vendor and user.

Only two years into user relations, Magnuson is helping to establish a users group, which would in turn help Magnuson understand its customers' needs and special problems, Moore noted.

Information Load

To sell commercial systems, vendors must digest an enormous amount of information about what users are doing and may do, according to Data General Corp.'s Barbara Babcock, formerly with DG's systems marketing. She is now the vendor's marketing manager for office automation systems.

A big problem with office systems, she told CW, is figuring out who will buy them — office managers? DP managers? Also, users seem a little afraid of the technology, she said.

Turnkey systems vendors must thoroughly understand their customers' needs and appreciate the end user's limited ability to develop sophisticated technology, according to Andy Demore, Prime Computer, Inc.'s Boston sales manager. Moreover, "when you leave something vague [in a customer agreement], you're in trouble."

Software Vendors

As for software vendors, Ken Parker of Applied Data Research, Inc. said some users overanalyze the problems programs are supposed to solve and some users underanalyze. The marketing vice-president emphasized that software vendors must offer "extensability" so packages can adapt to changes in applications needs and the user's programming milieu.

Alex Kuli, marketing director for Cincom Systems, Inc., reported that his customers sometimes request software revisions antithetical to the vendor's main product, the Total data base management system.

Some customers have asked for sequential access methods, for example, which would defeat the purpose of Total's random-access approach to storing data generated by transactions.

In data communications, the marketing vice-president of Codex Corp., John Pugh, considers users more knowledgeable than ever before and are demanding more customization in the modems, multiplexers and integrated communications systems that Codex turns out.

Finally, the marketing director of Timeplex, Inc., Brian Maloney, told CW that data communications users demand long-term expandibility of products plus upward and downward compatibility with other products. The push for universal interfacing and ever faster throughput capacities has made data communications an especially dynamic area of information technology with fierce competition among suppliers.

Antitrust Trial Set to Resume

WASHINGTON, D.C. — AT&T Executive Vice-President Morris Tanenbaum will be among the first witnesses called to the stand when trial of the federal government's antitrust charges against the phone company resumes here this week. Tanenbaum is expected to discuss Bell's procurement of telecommunications equipment.

One of the government's charges is that Bell for many years has purchased equipment from Western Electric Co. even when better quality equipment was available at lower prices from competing suppliers.

Presiding Judge Harold H. Greene may rule next week on AT&T's motion requesting dismissal of the case. The trial was recessed last week so Greene could read the phone company's 553-page brief and the government's 411-page opposition.

Greene is not considered likely to dismiss the case, so the chief interest will be on AT&T's related request asking the judge to identify the charges remaining for trial. Clues to Greene's thinking are provided by the questions he asked during oral argument on AT&T's motion late last month.

One area he focused on was AT&T's obligation to interconnect with competing carriers before being ordered to do so by the Federal Communications Commission (FCC) and the courts.

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OCT. 19-20 LOS ANGELES

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SEPT. 14 NEW YORK
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OCT. 29 PITTSBURGH

STRUCTURED PROGRAMMING WORKSHOP

SEPT. 14-18 NEW YORK
SEPT. 28-02 COPENHAGEN
OCT. 5-9 PHOENIX
OCT. 5-9 SALT LAKE CITY

STRUCTURED PROGRAMMING WORKSHOP IN PASCAL

OCT. 5-9 PALO ALTO

STRUCTURED PROGRAMMING WORKSHOP IN COBOL

SEPT. 21-25 SAN FRANCISCO
OCT. 5-9 CHICAGO

STRUCTURED PROGRAMMING IN COBOL

SEPT. 14-15 CHICAGO
OCT. 22-23 SAN FRANCISCO

STRUCTURED SYSTEMS DEVELOPMENT

SEPT. 8 CHICAGO
SEPT. 10 WASHINGTON
SEPT. 15 SAN FRANCISCO
SEPT. 28 LONDON
SEPT. 28 MEXICO CITY
OCT. 5 NEW YORK
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DATABASE ADMINISTRATOR'S WORKSHOP

SEPT. 14-18 SAN FRANCISCO
SEPT. 21-25 WASHINGTON
SEPT. 28-02 CALGARY
OCT. 5-9 LONDON
OCT. 5-9 DALLAS
OCT. 19-23 SEATTLE
OCT. 26-30 NEW YORK

DATABASE MODELING & DESIGN WORKSHOP

SEPT. 14-18 CHICAGO
SEPT. 21-25 HOUSTON
SEPT. 28-02 TORONTO
OCT. 5-9 MINNEAPOLIS
OCT. 19-23 LOS ANGELES
OCT. 19-23 NEW YORK
OCT. 26-30 SAN FRANCISCO

STRUCTURED ANALYSIS & DESIGN WORKSHOP

SEPT. 14-18 HOUSTON
SEPT. 14-18 TORONTO
SEPT. 21-25 ATLANTA
SEPT. 21-25 HONOLULU
SEPT. 28-02 SAN FRANCISCO
OCT. 5-9 FAIRBANKS
OCT. 5-9 INDIANAPOLIS
OCT. 5-9 MINNEAPOLIS
OCT. 19-23 BOSTON
OCT. 19-23 MILWAUKEE
OCT. 26-30 LOS ANGELES
OCT. 26-30 NEW YORK

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SEPT. 14-15 NEW YORK
SEPT. 22-23 SAN FRANCISCO
SEPT. 24-25 NASSAU (BAHAMAS)
SEPT. 28-29 HOUSTON
OCT. 1-2 AMSTERDAM
OCT. 5-6 CHICAGO
OCT. 14-15 ORLANDO
OCT. 15-16 PHOENIX

STRUCTURED DESIGN WORKSHOP

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SEPT. 14-18 SALT LAKE CITY
SEPT. 21-25 LOS ANGELES
SEPT. 21-25 WASHINGTON
SEPT. 28-02 ATLANTA
SEPT. 28-02 MINNEAPOLIS
OCT. 5-9 DENVER
OCT. 5-9 SAN DIEGO
OCT. 19-23 CHICAGO
OCT. 26-30 AMSTERDAM
OCT. 26-30 HOUSTON

DATABASE FOR MANAGERS

SEPT. 2 TORONTO
SEPT. 28 LONDON
SEPT. 28 SAN FRANCISCO
SEPT. 30 CHICAGO
OCT. 1 NEW YORK
OCT. 15 LOS ANGELES

ADVANCED STRUCTURED ANALYSIS: LOGICAL MODELING WORKSHOP

SEPT. 14-18 DENVER
SEPT. 21-25 HOUSTON
SEPT. 28-02 SAN FRANCISCO
SEPT. 28-02 TORONTO
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Why Did Hinckley Go Unnoticed?

WASHINGTON, D.C. — Why would the Secret Service have been unable to detect John W. Hinckley Jr. as a possible threat to President Reagan even if it had had greater DP resources?

The recently issued Treasury Department report noted that Hinckley had been arrested in Nashville last October on a weapons charge — during the same week Reagan and then-President Carter had campaign activities scheduled for Nashville and Memphis.

News of Hinckley's arrest was not passed to the Secret Service by the Federal Bureau of Investigation, but the report said this "was not unreasonable" because there are "thousands of such arrests annually . . . There was nothing in the circumstances of Hinckley's arrest to suggest that he was or would become a danger to the President."

Even if the information had been passed on, the report continued, "one cannot conclude that the consequences would have been different." The service does not have the manpower to interview every person who was arrested . . . in each city visited by the President in the course of a political campaign."

In any case, "the most the service could reasonably do with raw arrest information would be store it for later correlation with other acts," Treasury said. If the same person were later arrested in another city the President is visiting, "the coincidence might suggest that he is 'stalking' the President and justify a more thorough investigation.

"Today, the service's resources do not permit such data correlation," the study concluded. It added "the data processing and intelligence resources required for a system which could achieve such correlation would be massive." And "there could be no assurance that the linking of circumstantial data to support an inference of danger would be more than mere chance."

Wide World Photo

Two Secret Service agents shove President Reagan into his limousine after the March 30 assassination attempt. A recently released Treasury Department report said even upgraded DP resources would not have helped the Secret Service avert the incident.

Report: Secret Service DP Could Not Shield Reagan

(Continued from Page 1)

laws as they apply to information provided the Secret Service. Organizations would then no longer fear for the confidentiality of information passed on to the service, the report said.

In a general comment on the agency's DP operations, the report said "the service has not developed an in-house capability to use modern statistical analysis and automated data processing facilities to derive maximum utility from the information it has in its possession."

However, the Treasury Department was careful to state that no additional amount of DP capacity would have detected Hinckley as a possible threat to the President (see related story).

Congressional inquiries immediately after the assassination attempt had focused in part on whether the accused gunman should have been identified in the Secret Service data base of dangerous persons.

But, the report continued, the Secret Service could do a better job of identifying environments dangerous to protected persons: The agency "is failing . . . to make use of advances in statistical methods and data processing to improve its analytical abilities."

The service is currently working with the National Academy of Sciences to improve its operations in this area, Treasury noted. But the department also noted the so-far-unheeded advice from an independent consultant, which in 1969 suggested the agency develop better statistical tools for using the information now contained in the agency's intelligence files.

The report recommended the service create "a more sophisticated planning and research operation," including additional personnel trained in DP, statistical methods and behavioral sciences. The group would be responsible for analyzing, on an on-going basis, "the intelligence data base in order to identify what types of information the Intelligence Division should be looking for and what it should be doing with it."

This effort would include, the report said, a better definition of data system needed by the division "to ensure that adequate computer programming and data processing support is provided to this enterprise."

Dallas Videotex Goes Regional

DALLAS — Belo Information Systems On-Line Network (Bison) began operation here recently. Developed by the publishers of the *Dallas Morning News*, Bison is reputedly the "first commercial regional videotex system in the country," a spokesman said. It costs $10 per month.

For that price the user receives the text of each day's *Dallas Morning News* on-line, stories from a number of wire services and news syndicates, an entertainment guide, restaurant directory, sports schedules and a local airlines timetable.

Bison is intended to serve both residential and business subscribers. Among the information products to be added shortly is UPI's "Unistox" financial wire, a spokesman reported.

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'I Don't Believe Computer'

Goode Picks Eagles in Next Super Bowl, But . . .

By Bruce Hoard
CW Staff

LOS ANGELES — Bud Goode, the doyen of computerized football prognosticators and self-styled "world's greatest 58-year-old body surfer," has picked the Philadelphia Eagles by two points over the San Diego Chargers in Super Bowl XVI.

There is just one problem with his automated prediction.

"I don't believe the computer," Goode said.

Disbelieve a perfectly healthy Univac 1106 jampacked with 130 arcane football variables? Ridiculous, you say. Not so, maintained Goode, who perhaps better than anyone else recognizes the strengths and weaknesses of the weekly readout he peddles to a host of the NFL's most successful coaches.

Projected Winners

Whether or not he believes his computer, the statistical impressario has used it to come up with projected winners in each of the league's six divisions. Just in case you are interested:

NATIONAL FOOTBALL CONFERENCE (NFC)

Central Division	**Win**	**Loss**
Detroit	10	6
Eastern Division		
Philadelphia	13	3 (or 14 and 2)
Western Division		
Los Angeles	13	3

AMERICAN FOOTBALL CONFERENCE (AFC)

Eastern Division	**Win**	**Loss**
New England	12	4
Western Division		
San Diego	13	3
Central Division		

Four-way tie: Cleveland, Houston and Pittsburgh, all 9 and 7. Cincinnati, 8 and 8.

To the untrained eye, it appears that Cincinnati would be unable to achieve a tie with three other teams sporting a better record. However, nothing is cast in concrete when it comes to Goode's program.

"My own opinion of these long-range predictions is that the top teams will regress one or two games toward the mean," he noted. While he may seem to be creating a comfortable amount of breathing room for himself, it seems fair for someone who only breaks even on his forecasts.

The problem is, human beings simply refuse to follow the identical statistical pattern week after week. Let's say the Pittsburgh Steelers' Terry Bradshaw averages 12 yards per pass attempt (the league average is six, Goode noted) one week and only two the next.

"That's a spread of 10 yards per pass," he observed. "One yard is worth three points in the winning margin, so that's tantamount to a 30 point spread." In other words, computerized chaos.

Cowboy Contenders

Despite such weaknesses, the program, which generates a 60-page weekly package, hones in on some telling statistical stories. For instance, the Dallas Cowboys are being touted by some experts as Super Bowl finalists. In 1977, they led the league in allowing fewest yards per pass attempt, Goode said.

Since 1977, the once proud Cowboy pass defense has given up an additional three-quarters of a yard per pass attempt each year, bringing it over six yards per attempt and down to a mediocre 16th in the league last season, he continued.

However, that particular defensive deficiency may not be as telling as it appears when one realizes the average distance per pass attempt has increased 12 in., 10 in. and 10 in. yearly since the NFL liberalized its pass defense rules in 1978.

As a matter of fact, Goodian statistics now show that in 10 cases out of 12, the running game is most associated with teams winning and losing more games than would normally be expected of them.

Goode, who has been calling 'em as the computer sees 'em for 20 years, 15 years professionally, replied, "The Jets completely throw me," when asked which team is the most psychologically quirky and therefore most difficult to predict.

New York led the league in rushing yardage in 1979 and then ran last in the category over the first five games of the 1980 season. Incidentally, a slightly more well-known prognosticator named Jimmy the Greek tabbed the Jets to win it all last year, and now Anson Mount of *Playboy* has picked them to win Super Bowl XVI this time around, Goode said.

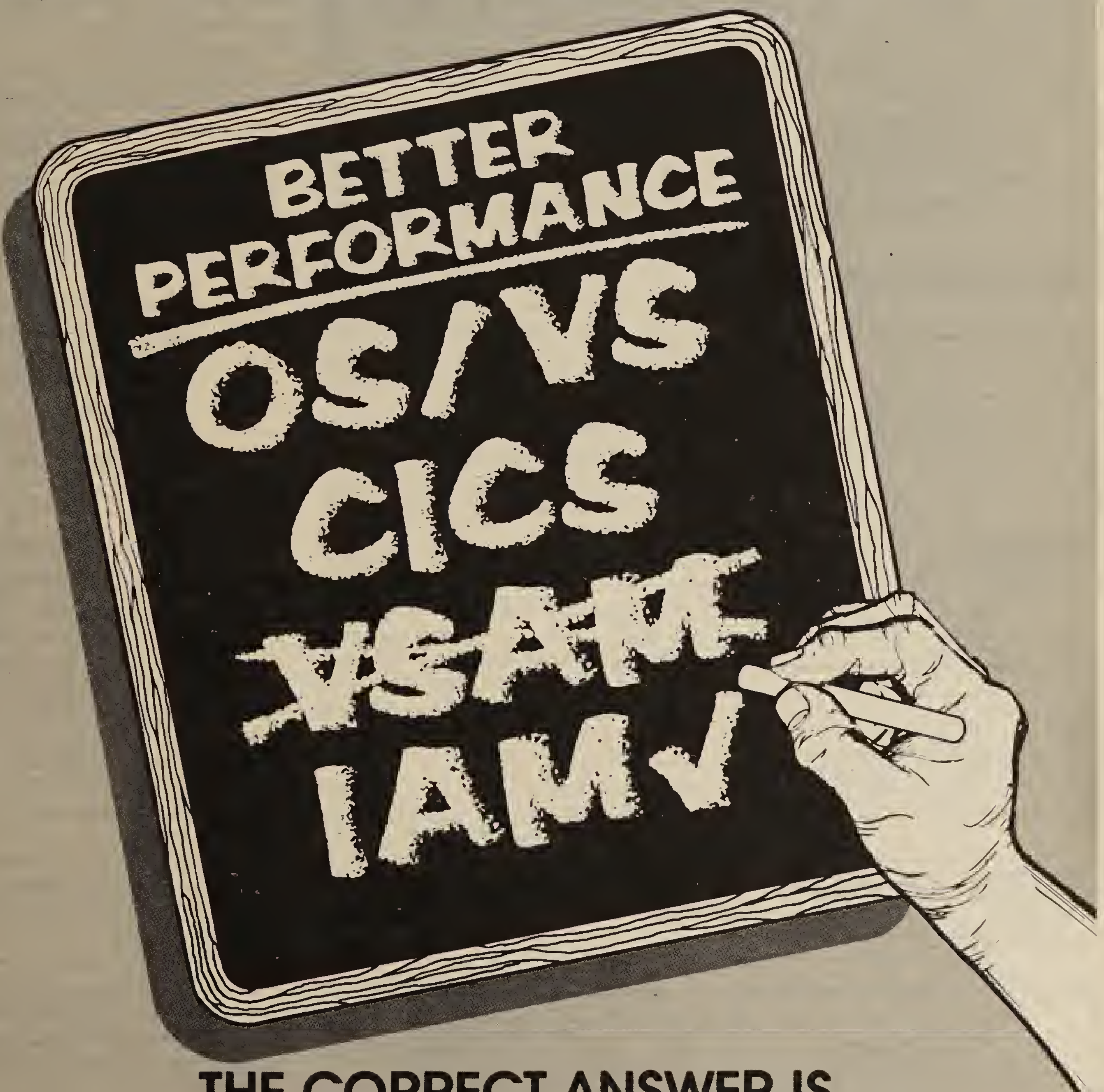
The Goode reaction? "*Playboy* has got to have its head in the sand."

Corrections

The correct name of I-Concepts, Inc.'s report writer for the IBM Series/1 [CW, Aug. 17] is Assistar.

The price of Dataquest, Inc.'s manual entitled "Rigid Disk Drives — 1981 Specifications and Prices" [CW, Aug. 3] is $295.

Don't Make The Same Mistake



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Ex-Con Says He Got Up to $400,000 per Delivery

(Continued from Page 1)

more chips than the original manufacturer could provide — and offered them at half the wholesale price — I would have started asking questions. Wouldn't you?"

Siemens' Oswald also admitted last April doing regular business with a man authorities charge is the moving force behind the largest high technology smuggling operation ever uncovered in the U.S. His name is Werner Bruchhausen, and five federal police agencies recently cooperated to bring a sweeping 60-count federal indictment against him and three other defendants [CW, Aug. 31]. Bruchhausen stands accused of smuggling more than $8 million worth of illegal exports to the Soviet Union and East Germany over a three-year period.

The 'Gray Market'

To truly understand this story, it is necessary to start at the beginning.

During the last decade, microcomputer chip manufacturing has grown from virtually nothing into a $14 billion per year industry. With each new advance, equipment manufacturers like Siemens have come up with exciting applications for the devices.

As in many other fields, companies that lag behind or cannot supply their customers with the latest technology soon lose their customers in a rapidly changing marketplace.

Today, the overwhelming majority of chips are sold directly by manufacturers who specialize in their fabrication or through franchised distributors. But another source for the chips has emerged as well. It is the "gray" market, the telex-linked network of companies who specialize in reselling manufacturers' overstocks and in supplying hard-to-find chips when the manufacturers and franchised dealers say they have none to sell.

This work, supporters argue, is an essential service to the industry and, although it is unpopular with some manufacturers and franchised distributors, it is perfectly legal. Unfortunately, however, it is sometimes very difficult to tell just when this "gray" market becomes a black market in stolen chips — as Siemens has learned.

An Offer It Couldn't Refuse

One of the most important developments in the chip building industry during 1979 was the introduction of new 32-bit erasable programmable read-only memories (Eprom) known as the Intel Model 2732 and 2732-6. They permitted hundreds of new applications in communications, medicine, machine control and many other fields.

Despite a wholesale cost of almost $100 per chip, the demand for these Eproms was enormous — and Intel was the only company building them. Equipment manufacturers like Siemens, informed that the new chips were on their way, had already begun to design them into their product lines.

Because Intel could manufacture only a limited number of chips, however, it was forced to set limits on purchases. Despite Siemens' status as one of Intel's largest and most reliable customers, it was limited to approximately 1,000 Model 2732 chips per month.

Then, in November 1979, a leading German electronics distributor, EBV Elektronik Bauelemente Vertriebs GmbH, made an offer that Siemens couldn't refuse: 10,000 Model 2732 chips at only 108 deutsche marks each — only slightly more than half the ordinary wholesale price. Unfortunately for both EBV and Siemens, the chips turned out to have been stolen.

Intel Engineer Accused

California state authorities now accuse Albert Williams, a former quality control engineer at Intel, of being the thief who first obtained the chips that found their way to Siemens. According to court testimony, Williams smuggled almost $1 million worth of the 2732 chips out of Intel in the lining of his coat during October and November of 1979. He allegedly turned them over to John Jackson, president of Dyno Electronics Corp. in Santa Clara.

Jackson himself is now charged in the state courts with printing counterfeit Intel trademarks and processing numbers on the chips in order to give them an appearance of legitimacy, as well as with passing on the chips to the next link in the chain that eventually brought them to Siemens.

Many records pertaining to the trials of Jackson and Williams have been sealed by the courts. However, according to reliable sources familiar with the proceedings, Jackson is now testifying against his former associates. Both Jackson and Williams have pleaded innocent to the charges they face.

Intel-Siemens Meeting Fails

As early as Nov. 16, 1979, Intel sales people in Europe had reported to their home office that "Siemens is able to buy 2732s in quantities of 10,000/month from an unknown source. Siemens buyers," the confidential internal Intel memo continues, "will not reveal as to where they are buying the units." This was having an "obvious negative effect" on Intel's market.

Intel asked Siemens for samples of the suspicious chips. Siemens agreed to provide them at a Dec. 7 meeting in Brussels.

When Dec. 7 arrived, however, Siemens failed to turn over the samples. A confidential Intel memo now in court records describes Intel's view of the meeting: "When asked to give the names of the dealers [of the 2732s], Dr. Oswald [of Siemens] expressed concern that if he did, Intel would cut off Siemens' source of parts. After [Intel's representative] Jean Claude pressed the question, Dr. Oswald said he wasn't exactly sure who the dealers are . . .

"Jean Claude told Dr. Oswald that Siemens was very likely buying stolen parts. He told Dr. Oswald of the theft problems we have had. Dr. Oswald acknowledged the problem and . . . told Jean Claude that they bought the parts because they needed them badly and Intel could not supply them.

"Jean Claude feels that Dr. Oswald does not want to reveal the names of the dealers. He does believe that Dr. Oswald knows."

Intel Turns Up Heat

Intel began to turn up the heat on Siemens. On Jan. 7, 1980, a month after Siemens had been informed that Intel believed the chips to be stolen, Intel security chief Bill Bankert drafted the following secret memo for Robert Borovoy, Intel's chief counsel:

"Gernot Oswald is still reluctant to tell us where Siemens is buying the 2732s that we say are stolen . . . Under German law, all of the product could be frozen by the courts until the case is resolved. Oswald does not want this to happen . . .

"We currently have enough information that we could likely cause the German courts to put a hold on the product. Since the parts are in Siemens' completed product, the freezing of it could cause the type of pressure needed to encourage Siemens' cooperation. It would certainly be better if we did not have to use a pressure approach. However, we need to . . . be ready to move."

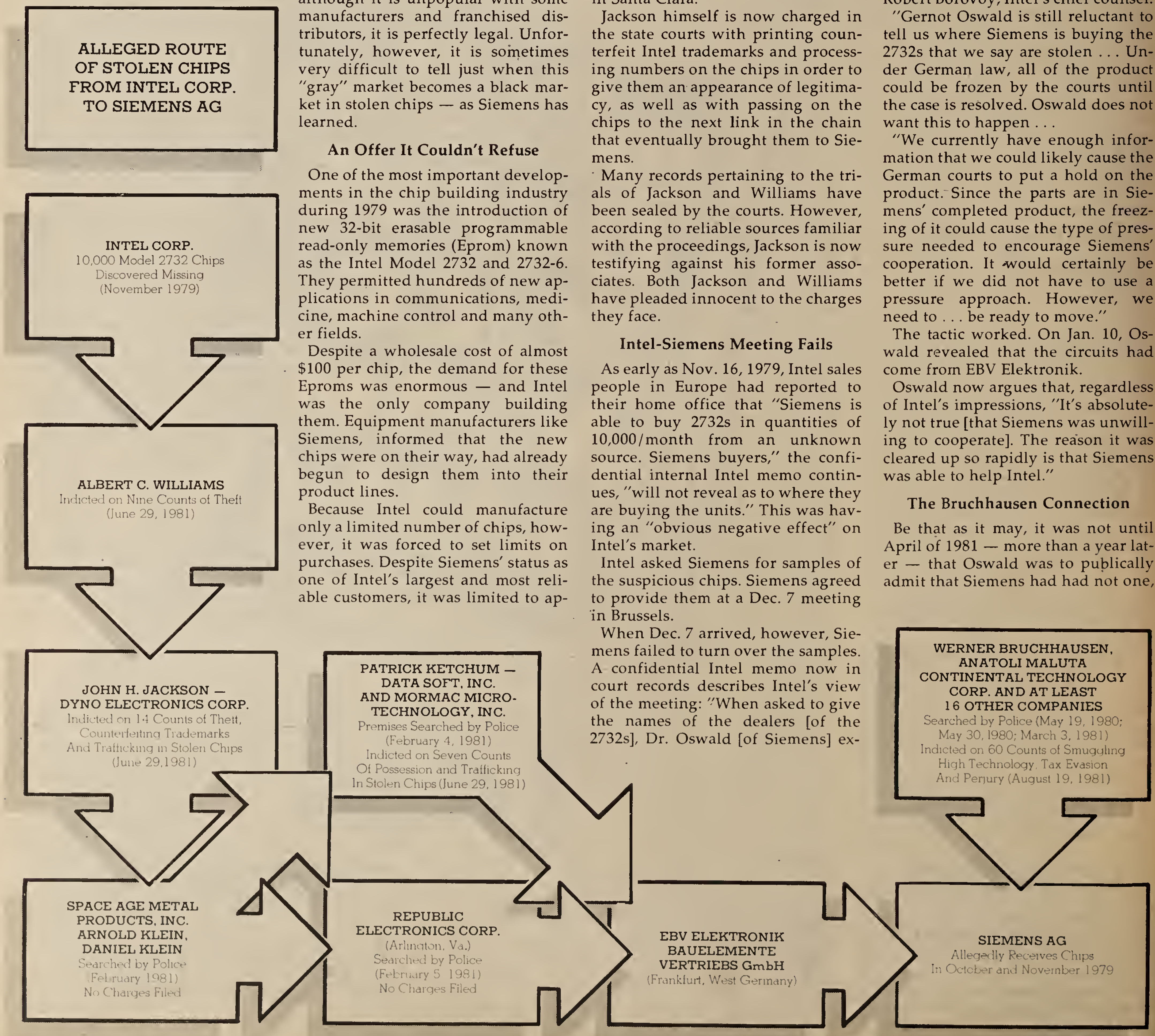
The tactic worked. On Jan. 10, Oswald revealed that the circuits had come from EBV Elektronik.

Oswald now argues that, regardless of Intel's impressions, "It's absolutely not true [that Siemens was unwilling to cooperate]. The reason it was cleared up so rapidly is that Siemens was able to help Intel."

The Bruchhausen Connection

Be that as it may, it was not until April of 1981 — more than a year later — that Oswald was to publically admit that Siemens had had not one,

ALLEGED ROUTE OF STOLEN CHIPS FROM INTEL CORP. TO SIEMENS AG


INTEL CORP.
10,000 Model 2732 Chips
Discovered Missing
(November 1979)
ALBERT C. WILLIAMS
Indicted on Nine Counts of Theft
(June 29, 1981)
JOHN H. JACKSON — DYNO ELECTRONICS CORP.
Indicted on 14 Counts of Theft,
Counterfeiting Trademarks
And Trafficking in Stolen Chips
(June 29,1981)
PATRICK KETCHUM — DATA SOFT, INC. AND MORMAC MICRO-TECHNOLOGY, INC.
Premises Searched by Police
(February 4, 1981)
Indicted on Seven Counts
Of Possession and Trafficking
In Stolen Chips (June 29, 1981)
SPACE AGE METAL PRODUCTS, INC. ARNOLD KLEIN, DANIEL KLEIN
Searched by Police
(February 1981)
No Charges Filed
REPUBLIC ELECTRONICS CORP.
(Arlington, Va.)
Searched by Police
(February 5 1981)
No Charges Filed
EBV ELEKTRONIK BAUELEMENTE VERTRIEBS GmbH
(Frankfurt, West Germany)
WERNER BRUCHHAUSEN, ANATOLI MALUTA CONTINENTAL TECHNOLOGY CORP. AND AT LEAST 16 OTHER COMPANIES
Searched by Police (May 19, 1980; May 30, 1980; March 3, 1981)
Indicted on 60 Counts of Smuggling
High Technology, Tax Evasion
And Perjury (August 19, 1981)
SIEMENS AG
Allegedly Receives Chips
In October and November 1979

Source Court Records in Santa Clara (Calif.) County; Los Angeles, Calif., Arlington (Va.) County and Alexandria, Va.

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as Stolen Chips Dealer

but two suppliers of "hot" 2732 chips.

In an interview with the *Wall Street Journal*, Oswald said that Werner Bruchhausen had supplied Siemens with what would later prove to be stolen circuits during the same time period. Bruchhausen was "a source to us, a business partner" who was "supplying the whole industry in Germany with quite a few electronic products."

In another extraordinary example of black market activities, Intel alleges that it discovered that ADT Analog und Digital Technik of West Germany, a company that the Department of Justice charges is controlled by Bruchhausen, was offering Intel Model 2764 chips (the 64-bit successor to the 2732) to customers in Europe during December 1979 — before Intel had even put them on the market. The 2764s were allegedly offered in telex messages between gray market distributors, which the industry often uses as a form of advertising.

Evidence has also come to light that Siemens may have been trading with Bruchhausen in hot chips as late as October of 1980 — although there is no proof that Siemens realized the chips were stolen at the time.

As reported in last week's *Computerworld*, Santa Clara County Deputy Sheriff Wayne Brown, while working undercover as a dealer in stolen microcomputer chips, approached Roger Pitkin of Quest Electronics during September and October 1980 with offers to sell stolen chips. Pitkin was interested.

The hot chips were to be sent to "a German individual associated with Siemens of Europe and West Germany," one of Brown's police reports reads. The unnamed German "dealt directly with Siemens of West Germany, of which [sic] he has a good inside contact."

When the deal for the hot chips was consummated later that month, the chips were shipped to "the German" at ADT Analog und Digital Technik, a company allegedly controlled by Bruchhausen. (Pitkin has since pleaded no contest to charges of trading in stolen chips.)

Back to January

But this is getting ahead of our story. Back in January 1980, few people had ever heard of Werner Bruchhausen outside the circle of companies that trade in the electronics gray market, and Santa Clara sheriffs were still trying to discover what had become of the 2732s missing since the previous November.

Two events were to take place that would soon change that. First, John Jackson's former secretary and bookkeeper approached police and began to reveal details of Jackson's operation, including information about what happened to the chips after they left Jackson's hands.

Second, Jackson himself was jailed on a parole violation. After three months in the Los Angeles County jail, he was ready to talk.

"Jackson," according to the internal police summary of the statement he gave to the Sheriff's Department and the FBI, "indicated that there were three major outlets for the sale of stolen ICs [integrated circuits] from this area to Southern California. He stated that one is [name deleted]. Another is Tony Maluda, who owns a security firm in Torrance, and Arnie Kline, who owns Space Age Metals in Artesia, Calif. Jackson also indicted that Pat Ketchum . . ."

Electronics Underworld

It should be noted here that one of Jackson's many convictions involved making fraudulent claims. Obviously, his statements about others must be considered in that light.

Subsequent investigation established that "Tony Maluda" was, in fact, Anatoli Maluta, owner of the Consolidated Protection Development Corp. of Torrance and the man who was eventually to become a codefendant with Bruchhausen in the smuggling scheme. Maluta has pleaded not guilty to all counts in that indictment and, through his attorney, has denied involvement in the trade in stolen chips as well.

Arnold Klein was not available for comment, but his brother Daniel, who is co-owner with Arnold of Space Age Metal Products and spokesman for the company, denied any involvement whatsoever in stolen ICs. Jackson's allegations are "absolutely false," Daniel Klein contended.

Patrick Ketchum, the general manager of Mormac Microtechnology, Inc. of Tarzana, has a prior conviction for trading in stolen microcomputer chips and is presently facing new charges of trading in stolen circuits. Company spokesmen say he is not available for comment. He has, however, pleaded not guilty to the charges.

Links Come Clear

Meanwhile, Intel was continuing its attempts to trace the chips back to their source. It was not long before EBV Elektronik admitted that it had obtained from two American companies the chips it sold to Siemens. EBV named its sources: Republic Electronics Corp. of Arlington, Va. (not to be confused with the Citron Corp. subsidiary named Republic Electronics, Inc. of Melville, N.Y., or the Republic Electronics Corp. of Patterson, N.J., which has outlets in numerous cities, or with other companies of similar names); and Mormac Microtechnology — the same Mormac that employs Ketchum.

Slowly, the links were beginning to become clear. As California state prosecutors now reconstruct it, the chain fits together like this: First, Williams allegedly stole the chips from Intel. From there they traveled to Jackson to be marked with counterfeit trademarks. Jackson knew perfectly well the chips were stolen, prosecutors said.

Then the path grows murky for awhile. Somehow, Republic Electronics and Mormac Microtechnology obtained the chips. They passed them to EBV, and from there they

(Continued on Page 10)

How to increase programmer productivity in a COBOL shop

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When you think of it, programmer training is pretty haphazard. After a few language courses, programmers go into on-the-job training. Which usually means, they're on their own. So if a programmer ever learns to write efficient, easy-to-read, easy-to-maintain programs, it's largely through his or her own doing.

Not long ago, for example, I looked through the listings of some COBOL programs written by a senior programmer in a medium-sized System/370 installation. To my surprise, the programs were poorly written. They were written in an almost impossible to understand style; there was no structure to them; and there were many inefficient coding practices throughout.

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Then, the Report Writer text shows: how much faster and easier it can be to do a report program in Report Writer than in standard COBOL; how to use Report Writer in all its variations; and when to use it so it's most effective as a productivity tool.

In contrast, the structured-programming text covers subjects like: how to design programs so they are easy to code, debug, and maintain; how to use documentation and code from an old program when developing a new one; and how to increase productivity with techniques like structured walkthroughs. The accompanying cookbook gives standards for a structured COBOL shop, so a programmer can easily find the answers to program-development questions. And it gives complete documentation for 4 business programs...documentation that can save many hours of effort on new program development.

As for the assembler language books, they include subjects like: how to write a subprogram that can be linked to a COBOL program; how to write a routine for bit manipulation or code translation when COBOL is inefficient; how and when to use assembler language for processing ISAM or direct files. And always, these books give that extra level of understanding that can turn an average programmer into an outstanding one.

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Modem Makers, Bell at Odds Over Information

(Continued from Page 1)

one-year lead time over non-Bell competitors in which to make the necessary modem changes.

"They're changing the timing of the equipment you need to work on the network and they're announcing the change to the public and changing their equipment at the same time and trying to keep it a secret," Johnson declared.

Bell is also charging a "license," or "royalty" fee, for manufacturers who wish to obtain the technical specifications needed to alter their modems, he charged, adding, "Isn't that asinine?"

The president suggested Bell route voice messages over satellite links and data messages over terrestrial lines, obviating the need for the modem changes.

George Grumbles, vice-president of marketing for Universal Data Systems, Inc., said his company has found it "rather difficult" to get data on modem-related delays and echoes.

On the question of a one-year lead time for Western Electric, he observed, "There's no question they [Bell] are giving them a significant lead time." Western Electric would continue to enjoy preferential treatment from AT&T if and when it becomes a separate subsidiary from Bell, he added.

Bell claims the information in question is and has been public knowledge since it first introduced satellites to the public switched network in 1970 through a filing with the Federal Communications Commission (FCC).

The telephone company proliferated the knowledge through a series of articles in such publications as *Data Communications Using the Public Switched Network, Bell Labs Record, Bell System Technical Journal* and *Transactions in Communications,* according to Paul Grabow, district manager of Bell System Purchased Products Division.

AT&T also wrote the aforementioned "Dear Customer" letter and cooperated with manufacturers who had questions on the modem/satellite situation, he said. Grabow denied allegations accusing Bell of illegally witholding information in favor of Western Electric, saying, "No, I don't see how they can. I think, again, that the characteristics of the network have been described and the effects of satellites were described in our first filing with the FCC."

He acknowledged the existence of Western Electric license fees, but said they are only invoked when manufacturers ask to review specific, proprietary designs of Western Electric products.

Bill Plossl, district manager for Network Services, said the idea of sending voice messages over satellite links and confining data to terrestrial lines is technically feasible but too expensive. "The problem is identifying which calls are data. It is feasible, technically," he said. The way to do it is by identifying the second digit of any call. If it is a zero or a one, it will be a 10-digit, and thus data, call.

However, in order to make the necessary conversions to distinguish voice from data on a nationwide basis, Bell would have to spend $500 million, Plossl said.

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Stolen Chips Traced to Siemens

(Continued from Page 9)

went to Siemens. Simultaneously, Bruchhausen was also allegedly moving hot chips through his own channels.

An intricate chain, perhaps, but also profitable. The final take on these stolen chips totaled more than $500,000.

Only one link remained to be established: Where did Republic Electronics and Mormac get the chips?

Search warrants were executed against both in early 1981. Using information obtained in raids as well as testimony from informants, prosecutors indicted Mormac Microtechnology's Ketchum for purchasing at least one lot of stolen 2732s, selling them to EBV Elektronik and knowing full well that the chips were stolen. Ketchum has pleaded innocent.

A spokesman for Republic Electronics refused to answer reporters' questions about the source of the chips it sold to EBV Elektronik. A letter on file in federal court in Alexandria, Va., however, perhaps best captures the spirit of the business deals surrounding the 10,000 hot Intel chips that ended up in Siemens' hands.

"What puzzles me," a Republic Electronics official wrote to Klein at Space Age Metal Products, "is that these parts are as rare as hound's teeth [sic] . . . which seems to cover all the risks."

Santa Clara County Assistant District Attorney Douglas Southard, who is prosecuting Williams and Jackson, argued that both Republic Electronics and Mormac Microtechnology obtained their chips in lots of 5,000 each from Space Age Metal Products, which in turn got them from Jackson. The two lots of 5,000 were then immediately sold to EBV Elektronik.

Daniel Klein of Space Age Metal Products refused to answer reporters' questions on the source of its 10,000 chips. Despite police searches in February, no charges have been brought against Space Age Metal Products, Republic Electronics or their officers.

Advocates of the gray market in electronics do not, of course, view their business as corrupt. For example, William Morgan III, president of Mormac Microtechnology, argued in a Feb. 9 article in *Electronic Buyers News* that gray market firms "fill the void left by manufacturers' representatives and franchised distributors."

The independent distributor, as Morgan prefers to call him, is in "the segment of the business that is most attractive to that old free-wheeling entrepreneur."

In a letter to customers and a press release issued shortly after the police raid at Mormac Microtechnology, Morgan said that gray market distributors in general — and Mormac Microtechnology in particular — are suffering from a "campaign of harassment against nonfranchised distributors by the major integrated circuit manufacturers because these distributors legally usurp the manufacturers' leverage and control of the IC market . . . I think that Intel wants everyone to believe that any one of their product bought outside of their own distribution network is phony."

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For Alleged Contract Violations

La. Medicaid Processor Fined for Third Time

By Bill Laberis
CW Staff

BATON ROUGE, La. — A computer service bureau has been hit with a $50,000 fine, its third in as many months, for alleged violations of its contract to process state Medicaid claims.

The penalty, double the amount of the previous two, came despite admissions by state officials and health care providers that claims processing by The Computer Company has improved steadily.

"The service has improved, but so have our expectations of what we want from them," George A. Fischer, secretary of the Department of Health and Human Services in the state, said. "We will assess them on a monthly basis and take action we feel appropriate."

However, Fischer refused to comment on a published report in which he said EDS Federal Corp., which held the Medicaid contract until January this year, had hired a public relations counsel to exhort providers to complain about The Computer Company.

A spokesman for EDS in Dallas said his company does retain a public relations counsel in Louisiana, but insisted "he has not been in direct contact with any health care providers to encourage them to complain."

Widespread Dissatisfaction

Meanwhile, some state officials said they are becoming increasingly concerned over the reportedly widespread dissatisfaction of providers with The Computer Company's level of service. A handful of druggists have withdrawn from the Medicaid program, which caters primarily to the poor, and some small hospitals and clinics have indicated they would follow suit if Medicaid claims processing does not improve.

Last month, a special oversight committee to look into the delayed processing problem was created within the state legislature. Rep. Edward S. Bopp, cochairman of the committee, said the claims problem has raised "serious economic questions."

"I know of one rural clinic, the largest in the country I believe, that has billed Medicaid $900,000 since January and has collected only $300,000 of it," Bopp said. "We have to insure that proper health care is available to the poor. [The Computer Company] is doing its best to solve the problem. But we've got hospitals and drugstores threatening to abandon the program. We can't have that."

Bopp said his committee's work so far has determined that The Computer Company's hardware was insufficient to handle the Medicaid task when it took over from EDS. The $550 million Medicaid program in Louisiana generates more than 30,000 claims daily.

He added the claims problem was exacerbated by extra edit and audit checks (to verify claims for appropriateness) mandated by the state when the new Medicaid contract began.

Walter R.P. Witschey, president of The Computer Company, said his company's problems initially were the result of the high (40%) claims pend rate — the rate at which claims could not be automatically processed and required some manual verification.

This high pend rate, he said, was attributable to claims form changes mandated by the state for the new contract, as well as the extra edit and audit checks.

Witschey added that his company did not suffer from any extraordinary hardware insufficiencies, although he said it was hamstrung temporarily by changes made to the program software and by the training of new staff.

"The state has spelled out the problems and expects us to perform," Witschey said. "We have the pend rate down to 18% now, where it should be, and the claims backlog is getting smaller all the time."

But some providers are still restless. Two druggists in Lake Charles have recently withdrawn from the Medicaid program, accepting only cash payments for prescriptions.

One of those druggists is Harvey Prejean, secretary of the Louisiana Pharmacy Association and one of 43 druggists who have filed a $10 million suit against the state and The Computer Company. A hearing on that suit was scheduled two weeks ago, but has been postponed indefinitely.

Prejean claimed that the high pend rate, which resulted in thousands of claims returned unpaid to providers, was due to manpower glitches at the company's Baton Rouge office. Prejean said rate of Medicaid claims returned to his drugstore for resubmission went from less than 1% to 49% in the first month of the new contract.

"They did not even have any forms for us to use when they first took over, and they told us to use the old EDS forms," he said. "Then they came out with their own forms about 20 days later and said the others we had used were no good."

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Study Sees FBI's CCH Alternative in Jeopardy

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Expansion of a computerized criminal information system now under development by the Federal Bureau of Investigation (FBI) may be in jeopardy because of limited support by state law enforcement officials, according to Congressional researchers.

The proposed Interstate Identification Index (III) is seen by the FBI as a way to decentralize its controversial Computerized Criminal History (CCH) program to avoid the federalism and privacy questions that have long hampered implementation of an FBI-developed national system.

Although the current III pilot project was approved by the Attorney General's Task Force on Violent Crime [CW, Aug. 24], findings of the Congressional Office of Technology Assessment (OTA) suggest many states will not favor joining the system.

FBI-Maintained Index

The III proposal calls for an FBI-maintained index to state criminal records that could be queried by local and state law enforcement agencies. Transfer of the records to inquiring agencies would not be controlled by the FBI; the bureau would continue as the repository for federal and multistate offendor information.

The Justice Department hopes the index plan will put an end to long-held fears the FBI's CCH program would lead to a national police data bank and constitute federal interference in state law enforcement activities.

But the OTA draft report, now out for final comment, noted that "overall, many of the concerns about the possible adverse impacts of a full [centralized] record file (on due process, on employment and licensing decisions and on surveillance potential) also apply to a national index."

In addition, basic problems that have held down state participation in the CCH program — such as high cost and poor data quality — are not necessarily resolved by the decentralization proposal embodied in the III, OTA found.

The researchers did find strong support for the index system among officials of state criminal records repositories, but, OTA said, "some seriously question the cost-effectiveness of a national index."

OTA said it could not offer reliable cost estimates for a national computerized criminal data system, but noted a 1975 independent study that said a national system would cost about $361 million over a 10-year period.

In addition, many states would have to undertake a large-scale computerization program for their own criminal information systems in order to fully participate in a national program. About three-fifths of all states have computerized criminal history files, OTA found, but only about 25% of the estimated 35 million criminal files in the U.S. are computerized.

On a nationwide basis, OTA said "best available data" indicates the total cost for state automation over a 10-year development and operation period would be approximately $600 million in 1978 dollars.

Record Quality

On the subject of record quality, OTA said "since 50% to 90% of the records in three state CCH systems . . . were found by OTA to be incomplete, inaccurate and/or ambiguous, the utility and constitutionality of a name index based on arrests would appear to be questionable."

Added OTA: "Local criminal justice decision makers were generally skeptical of a name index primarily because of anticipated index quality problems and difficulty in obtaining the records on a timely basis, if at all."

The violent crime task force recommended legislation to provide grants to states wanting to computerize their files and join the III system, but the OTA findings suggest that even with federal funds, states may not find a national III cost-effective.

Approximately 6% to 22% of all arrestees have records in other states, constituting a "small but significant part of the total criminal population." But, OTA continued, "only a small percentage of crimes ever reach the stage where criminal history information makes the difference" in handling the cases.

OTA found 24 of 42 states responding to its survey favored a national index, but the report said access policies, which vary from state to state, may inhibit national acceptance of an index program.

OTA suggested that legislation mandating participation may be necessary "because some of the larger states, whose participation would be critical to the success of an index, have in effect conditioned their participation on a strong federal audit function and strict controls over or prohibition on noncriminal justice access."

Capitol Hill sources said the mood in Congress is favorable for a final legislated resolution to the decade-long controversy over FBI involvement in national criminal history systems and that the task force recommendations will likely be received favorably.

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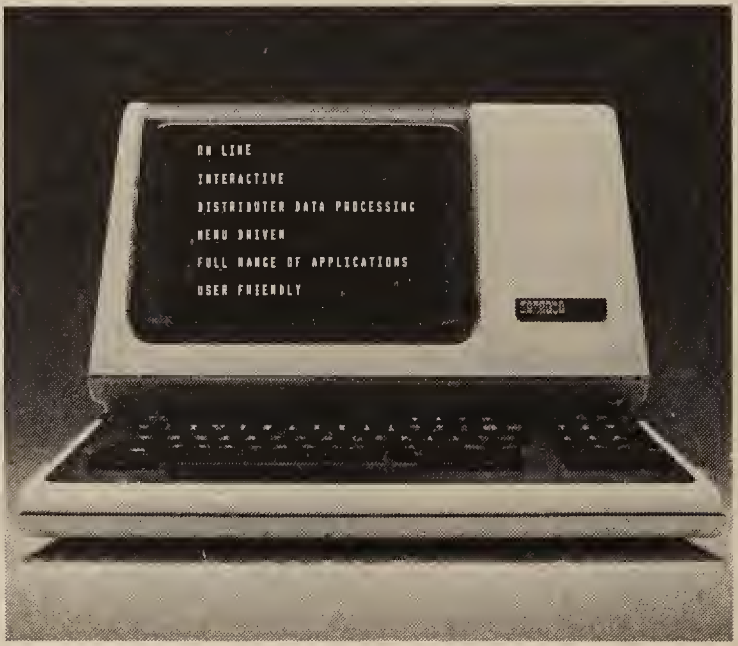

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Unfortunate Coincidence

Arsonist Torches DP Site While Backup Down

By Jeffry Beeler
CW West Coast Bureau

SAN DIEGO — An arson fire in this city's only blood bank recently gutted the organization's computing center, scorched its hardware beyond repair and destroyed or severely contaminated several disk packs containing irreplaceable backup and master data files.

By coincidence, the arsonist decided to strike on the same day that the blood bank inexplicably deviated from its usual data backup procedures, according to computing-department Manager Ramona Young.

The unlikely combination of arson and unintentional human error cost the blood bank dearly in data that might otherwise have been saved. Perhaps as much as 35% of the facility's disk stored donor files and 15% to 20% of its accounts receivable records were lost in the disaster, young estimated.

Although two reasonably intact and up-to-date disk packs were eventually fished from the wreckage, both were found to be unusable because of acute contamination. But with the help of a free-lance data recovery specialist David Brown, the blood bank was finally able to restore the ailing packs to temporary working order and thus retrieve the valuable data trapped inside.

Rare Breakdown

Brown's arrival on the scene was partly necessitated by a rare breakdown in the blood bank's routine backup procedures. To minimize the risk of catastrophic data loss, the facility continually maintains two identical sets of business files in separate locations.

One set, which consists of updated master files, is always kept in the blood bank's computing center. Each morning the contents of the files are routinely transcribed onto a spare disk pack to form a backup copy of the facility's latest business data. The backup pack is then whisked by courier to an undisclosed off-site location.

In theory, the resulting data redundancy is supposed to ensure that the blood bank will always have an extra copy of its most important business records if either its master or backup files are lost or destroyed.

On most days, the process of backing up the facility's updated master files proceeds like clockwork. But last July 12, a serious hitch developed. For some still unexplained reason, the backup copy of the previous day's master files was never delivered to its off-site destination, Young said.

Instead, the spare disk pack was inadvertently left behind in the data center alongside its duplicate master. Later that same day, the computing shop went up in smoke and in so doing temporarily deprived the blood bank of both sets of its disk-stored business information.

Young discounted the possibility that her organization's botched backup effort may have been contrived and that it was deliberately timed to coincide with the fire. Rather, she sees the two misfortunes as completely unrelated events that, by a stroke of almost incredibly bad luck, just happened to converge on the same day.

Local police are still investigating the case, but have yet to find out who set the blaze or what the arsonist's motive may have been.

Until recently, the blood bank's computing department occupied part of the third floor of a four-story office building and housed a Basic Four Corp. Model 700 processor with dual 75M-byte disk systems. However, since the fire the data center's staff has been forced to abandon its former work place and relocate its activities to another building elsewhere in the city.

The new operations base, which has been donated by a local business, is expected to serve as the computing department's makeshift home for at least another six months while the original data center is rebuilt.

Young has already ordered a replacement for her department's ruined Basic Four 700 and expects the new hardware to be delivered any day now. In the meantime, the blood bank will continue to borrow the services of an offsite processor belonging to Basic Decisions, Inc., a local Basic Four distributor.

Although the damage from the blood bank's fire was confined to a relatively small area, the computing room itself suffered almost total devastation. In addition to incinerating all the facility's hardware, the blaze "melted all our backup disk packs to the floor," Young recalled.

The master packs somehow escaped complete destruction, although massive contamination resulted when their plastic covers melted and collapsed onto the recording surfaces below.

Young credited Brown's disk-refurbishing efforts with recovering more than three-fourths of the blood bank's accounts receivable files and almost two-thirds of its donor histories.

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Warden Blames Computer For Escape of Four Cons

NEWTON, N.J. — A Sussex County warden blamed a faulty computer security system for the escape of four convicts from the Keogh Dwyer correctional facility here last month.

Warden Joseph Diemar said that a security and energy system installed early in 1979 by Robertshaw Controls Co. of Richmond, Va., the servicer of the system, did not correctly alert correction officers when the four convicts "penetrated" a cell window and escaped. Three of the criminals are still at large.

Diemar added that the system has not been working reliably since its installation, at which time officials attributed the problems to "new equipment."

Although Robertshaw did have people working on the system's problems, Diemar said the computer had been down since April. "Robertshaw was notified, but they couldn't bring it back on-line," Diemar explained.

Cable Problems

When asked what specifically was wrong with the system, a Robertshaw spokesman, Bob Pendergast, answered, "I heard that there was one problem with the cables and that some parts of the mainframe had to be replaced."

Pendergast declined to name the vendor of the equipment involved, but did say the problems have been corrected and the system is now online.

However, Diemar said the prison is still not 100% pleased with the system.

As a result of the escape, county officials are deliberating whether to bring suit against Robertshaw, according to County Counsel Donald Kovach.

Robertshaw stated that it knows nothing of any pending legal suit and that nothing has been received by the company concerning legal matters.

According to Diemar, his prison is not alone when it comes to prison computer security problems. He spoke of one New York state prison that he claimed has suffered losses in the $1 million bracket resulting from faulty systems.

William Houghton of Houghton Quarty and Warr, the architectural firm that designed the Sussex jail, noted that new prison facilities are now including these types of systems into their plans.

Houghton mentioned the Downstate correctional facility in New York as one currently using a system and Trenton State Prison in New Jersey as one that will have one installed.

NMA Plans Fall Seminar Series

SILVER SPRING, Md. — The National Micrographics Association (NMA) has announced the dates and locations for its fall seminar series.

"The Role of the Optical Disk in Future Document/Information Management Systems" and "Micrographic Systems Analysis and Design" are slated for Sept. 10 and 11, respectively, in Atlanta; Oct. 14 and 15 in Dallas; Oct. 26 and 27 in Boston; and Oct. 29 and 30 in Chicago.

Education Mission

Conducted in cooperation with NMA chapters, the seminars expand on the association's overall educational mission by offering such courses at various locations around the country.

The instructor for the Optical Disk seminar will be Dr. Gerry Walter, vice-president of research and development of image data systems at PRC Government Information Systems.

The Analysis and Design course will be taught by Franklin I. Bolnick, president of Microfilm Sciences Corp.

Individual seminars are $150 for NMA members and $180 for nonmembers.

Additional seminar information is available from Sue Wolk, Meeting Coordinator, NMA, 8719 Colesville Road., Silver Spring, Md., 20910.

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For further information call (212) 349-7450 at MSRA, Inc., Suite 200, 115 Broadway, New York, NY 10006.

THE OFFICE-VENDOR PERSPECTIVES FOR THE 1980's

Chairman: J. Walsh, Director Telecommunications & Office Systems — Avon Products

The IBM Perspective on User Requirements .... L. Crawford, Corporate Office Systems Center
- Who are the users?
- What are their requirements today?
- What are their requirements by 1985?
- Why integrate DP & OA?
- Benefits of our approach?

Exxon Perspective on User Requirements .... J. Beckmann, Product Manager Advance Systems
- Who are the users?
- What are their requirements today?
- What are their requirements by 1985?
- Why integrate DP & OA?
- Benefits of our approach?

Honeywell Perspective on User Requirements .... R. Harris, Director Marketing, Office Automation
- Who are the users?
- What are their requirements today?
- What are their requirements by 1985?
- Why integrate DP & OA?
- Benefits of our approach?

The Wang Perspective on User Requirements .... J. Cunningham Exec. Vice President
- Who are the users?
- What are their requirements today?
- What are their requirements by 1985?
- Why integrate DP & OA?
- Benefits of our approach?

Xerox Perspective on User Requirements .... Xerox Corp.
- Who are the users?
- What are their requirements today?
- What are their requirements by 1985?
- Why integrate DP & OA?
- Benefits of our approach?

THE OFFICE-USER PERSPECTIVES FOR THE 1980's

Chairman: J. Walsh, Director Telecommunications & Office Systems - Avon Products

How We Evaluated and Justified our Office Systems Approach: Case Studies. W. Cochrane, Director Bank of Montreal; M. A. Lieberman, Director Advanced Technology American Express Co.
- What were our requirements?
- Which vendors were considered & why?
- What were our objectives?
- How did we evaluate the products?
- Actual vs. potential benefits.
- Current status & future plans.

A Methodology for Quantifying Office Systems: Benefits to Management..... J. Walsh, Director Avon Products
- The data collection phase.
- The data reduction phase.
- The data analysis phase.
- Quantifying the benefits.
- Selecting the competitor products.
- Current status and future plans.

PANEL SESSION
- Open Forum: Questions & Answers

To Halt Turnover, Show Them You Care: Exec

By Bob Johnson
CW New York Bureau

NEW YORK — You can halt the huge turnover rate of DP professionals in an organization by showing them that management cares.

That statement summarizes the DP humanization philosophy of C. David LaBelle, vice-president of human resources at Manufacturers Hanover Trust Co. (MHT) here.

LaBelle came to MHT in 1972 to address a "people problem" he said the company was having at the time. As a result of his human resources program, LaBelle reported a 27% drop in turnover among systems and programming personnel in 1980. He projects this figure will be cut in half for 1981, down to about 14%.

The program brings together computer personnel with operations and clerical personnel and creates educational courses, monitors market salary levels and maintains what LaBelle feels is most important — Japanese-style quality circles.

The quality circles are made up of systems, programming and operations people; each is headed by a "facilitator" who manages its operation. LaBelle said the circles are working. "People are staying with the company because of what we are doing. They are turned on by having a say in what's going on."

LaBelle and his staff of more than 100 people are trying to come up with more and different ways to say "we care" to DP personnel. However, the encouragement is not only verbal. Some $87,000 in cash bonuses have been awarded to employees in the operations division, LaBelle said.

With a $1 million budget in 1981, LaBelle plans to offer performance appraisals, skills enhancement training and educational planning and career guidance to DP staff members to help keep them aboard. He said 27% of 353 graduates of an in-house computer programming trainee program are now part of the division's 463 member systems and programming staff.

The plan includes educational analysts who scout the markets looking for what is new and available in educational programs for MHT employees, LaBelle said.

"In computer operations, for example, there are not that many courses. We rely heavily on computer-aided instruction for this area," he added.

LaBelle looks at DP people in a special way. The type of work they do and the way their minds work are very different from other people in an organization, he said. "They are analytical, methodical and detailed people, for the most part. They look for order in their working environment, which sometimes causes a management problem."

There is often a lack of communication between management and worker, LaBelle acknowledged. "DPers have a tough time becoming managers because of it. Their nature is to do things themselves and not to deligate responsibility. For these reasons they often find it hard to understand management's way of thinking."

This is why management must be especially sensitive to their needs, LaBelle said. "DP people are not naturally people-oriented," he commented. "To keep DP people you have to reach them in a very special way."

LaBelle stressed the fact that there should be someone in an organization with a good DP background to be able to communicate between DPers and management. According to *Operations People*, an MHT publication for operations personnel, human resource advisors have been expanded under the program to deal directly with specific areas.

Europe DPers

In addition to the incentive aspects of LaBelle's program there is the DP recruitment function. He said he frequently looks to Europe for qualified computer people. There are now 100 people working in the operations division who are from England working on a visa, LaBelle said.

"They are excellent workers, highly motivated and some even express a desire to remain in the U.S. We are doing everything we can to get the right people," he said.

One of the most unique aspects of the program is MHT's hiring of handicapped people in the computer area. LaBelle understands how the computer can allow the handicapped to help themselves. This is evident in the DP division, which has more than 20 persons with different handicaps working as programmers and DP executives.

MICRO INFORMATION SYSTEMS FOR THE 1980's
Chairman: W. Augustine, Vice President, System Integration Associates

Market and Competitive Overview .... H. Segal, President Association of Computer users

- Competitive functional comparisons.
- Competitive performance comparisons.
- Competitive service/support issues.
- Market size and growth trends.

Application Specific Microcomputers vs. General Purpose Minis/Maxis ...... W. Augustine, Vice Pres. System Integration Associates

- Which is the best approach, for whom, and when?
- What criteria should you consider and what weightings?
- Some cost/benefit considerations.
- What applications are suitable?
- What applications are not suitable and why?

The Micro State-of-the-Art: IBM, Apple, Tandy, Commodore .... Speaker to be announced

- Where are we today?
- Where are we heading by 1985?

PANEL SESSION

- Open Forum: Questions & Answers
- Closing Remarks

*Topics and speakers subject to change for reasons beyond our control.
Additional speakers and biographical summaries will be supplied.

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Glossary Lists EFT Terms

WASHINGTON, D.C. — The American Bankers Association (ABA) is offering a glossary of terms used by financial institutions for electronic funds transfer (EFT).

"Developing a More Efficient Funds Transfer Service: Phase 1 — A Common Language," is the result of work by the ABA Operations and Automation Division Funds Transfer Terms and Usage Task Force, a spokesman said.

Copies of the publication are available to ABA members for $20 and to nonmembers for $25 from ABA, Order Processing Department, 1120 Connecticut Ave. N.W., Washington, D.C. 20036. The ABA catalog number 064400 should be included.

ABA Schedules Workshops For Middle, Senior Officers

WASHINGTON, D.C. — Middle management and senior-level bank officers who want to keep abreast of the changes in bank operations and automation, new markets, systems, regulations and technological advancements can attend either of two operations and automation regional workshops that will be held this fall by the American Bankers Association (ABA).

The theme of the workshops is "Achieving Operations Excellence." The workshops will include nine special interest sessions, a spokesman said.

The Western Regional Workshop will be held Oct. 28-30 in San Diego, and the Southeastern session will take place Nov. 15-17 in Orlando, Fla.

Both workshops will bring together bank operations and automation managers to exchange ideas and information on the important issues and changes affecting banking, a spokesman said.

The registration fee for either workshop is $250 for ABA members and $315 for nonmembers, according to the spokesman.

Additional information is available from Ann Seigel, ABA, Operations and Automation Division, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

EFTA Meet Scheduled For Oct. 21-23

WASHINGTON, D.C. — The Electronic Funds Transfer Association (EFTA) will hold a conference in Houston Oct. 21-23, which will focus on establishing and participating in the exchange of financial transaction information among automated teller systems.

The conference will also cover issues such as the financial, competitive and technical benefits of interchange as well as the standards essential to establishing national interchange capabilities, according to a spokesman.

The fee for the conference is $295 for EFTA members and $445 for nonmembers. Further information on the conference is available from Shelia de Valia, the EFT Association, Suite 800, 1029 Vermont Ave. N.W., Washington D.C. 20005.

Nacha Elects Moore As President

WASHINGTON, D.C. — W. Robert Moore, senior vice-president of Chemical Bank in New York, has been elected president of the National Automated Clearinghouse Association (Nacha).

As president of Nacha, Moore will head the executive committee and the board of directors.

He is also a member of the American Bankers Association's Operations and Automation Division's Payment Systems Policy Coordinating Group and is a director of the New York Automated Clearinghouse.

Nacha's membership includes 32 automated clearinghouses. The group is responsible for developing and monitoring standard specifications and rules for banks, savings and loan organizations and other financial houses.

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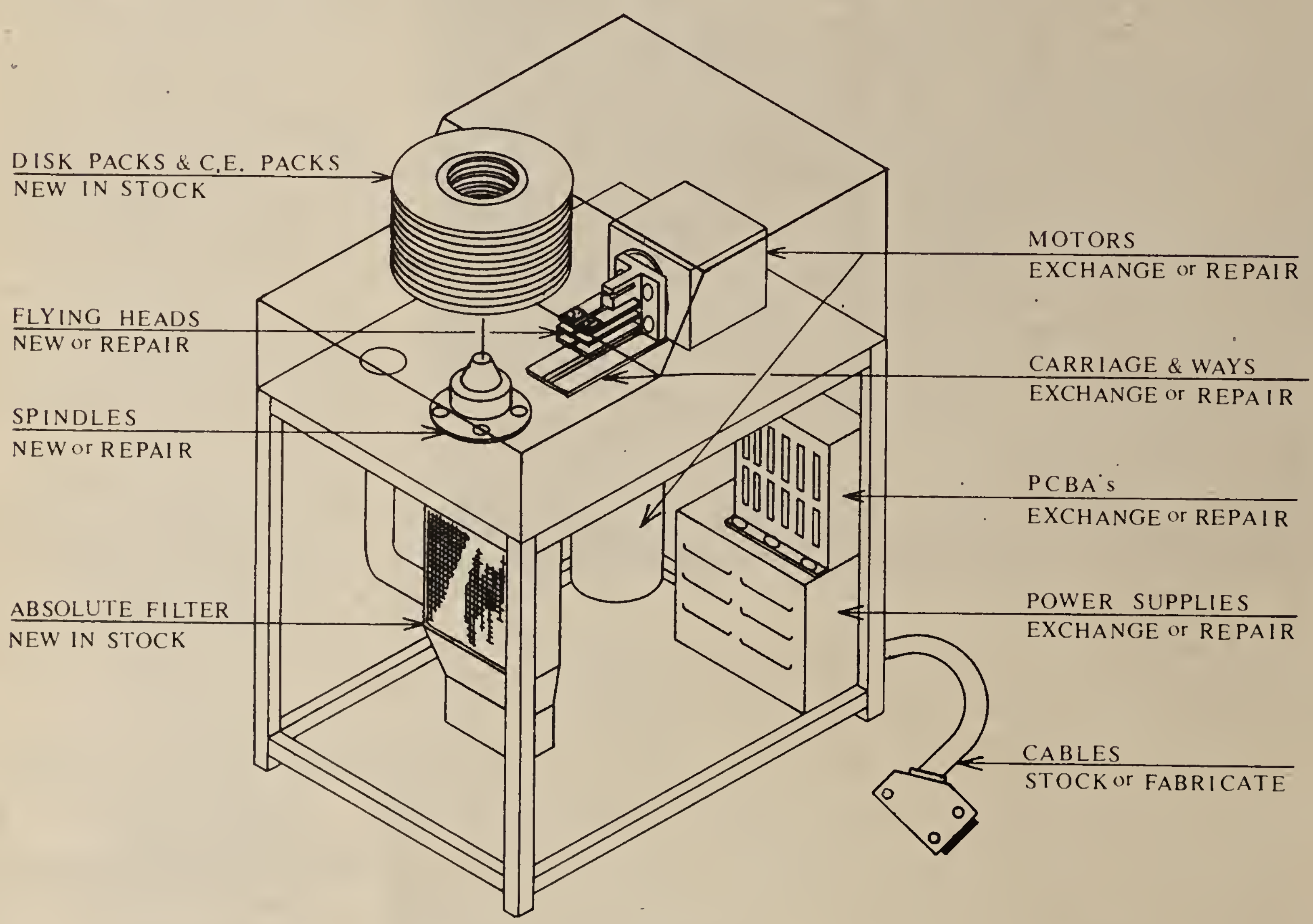

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Urges Federal Leadership

Study: Split Public, Private Information Roles

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The federal government should play a leadership but not a management role in facilitating development and use of information products and services, a special study group said recently.

Concerned about growing conflicts between government and private organizations over who should offer information services, the National Commission on Libraries and Information Science (NCLIS) commissioned the study two years ago by establishing a public sector/private sector task force.

The task force's report, circulating here for final comment, contains a number of principles and recommendations based on the premise that government information should remain available to all citizens, but private enterprise should be allowed to do what it does most effectively without interference or competition from the federal sector.

"The growth of information activities in our society poses unique problems with the relationships between the government and private sector," the task force said, explaining its mandate.

Need for Policy

Accompanying this development has been "an increasing interest throughout government in the development of policy that would guide the federal agencies in meeting their respective responsibilities to the public with respect to dissemination of information," the report said.

The NCLIS panel was charged with sorting out the conflicting views of the proper role of government in providing information resources, products and services.

Its recommendations were put forward to help Congress in its deliberations and to assist the Office of Management and Budget, which sets information policy for federal agencies, and to provide a framework for settling government and private sector disputes over who will offer what types of information services.

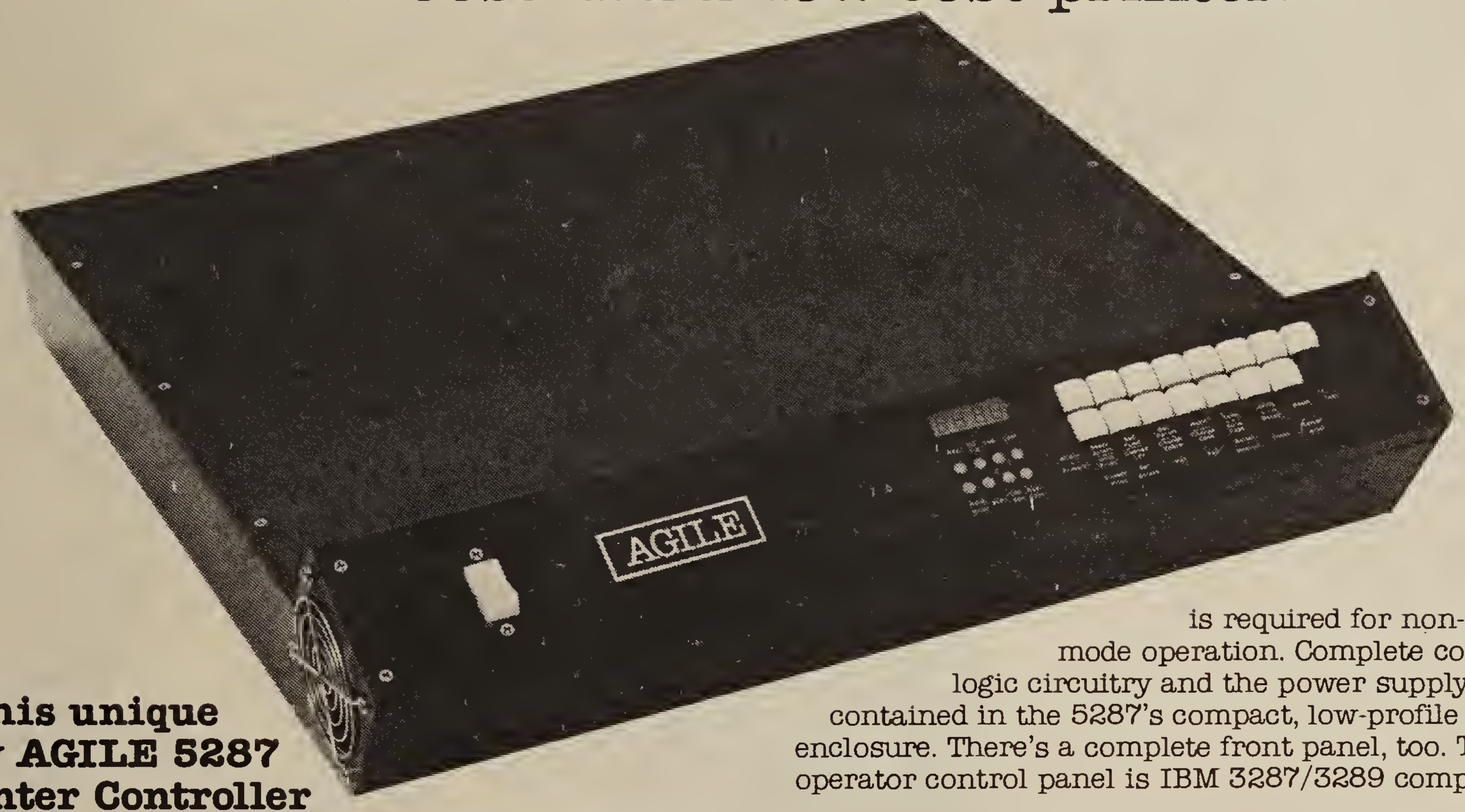
In its principles and recommendations, the task force said the federal government should:

- Assume a leadership role in facilitating the development and use of information products and services. The government should "affirm the applicability of the First Amendment to information products and services," the task force said.

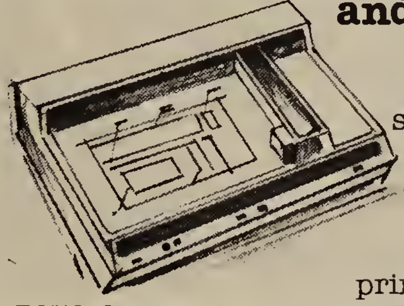
The government should also support basic and applied research in information sciences and educational programs to provide professional skills needed to develop information as an economic and social resource.

- Encourage, not discourage, through established policies, private sector investment in developing and using information products and services by identifying and eliminating legal and regulatory barriers to the introduction of new information products and services.
- Not compete with the private sector in offering these services "except when there are compelling reasons to do so" and only after private firms are given "every opportunity to assume the function commercially."
- Ensure that in federal information activities the property rights of private sector sources "are adequately protected."
- Ensure that its distributable information is "openly available in readily reproducible form without any restraints on subsequent use."
- Ensure that prices of government information reflect "the true cost of access and/or reproduction."
- "Actively use existing mechanisms, such as the libraries of the country, as primary channels for making governmentally distributable information to the public."

Finally, IBM 3274/3276 Cluster Controller users can choose **ANY** low-cost printer!

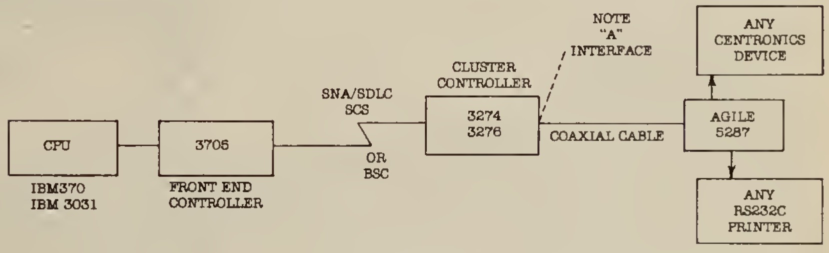


This unique new AGILE 5287 Printer Controller Interface supports both BSC or SNA/SDLC and SCS . . . while allowing you to output graphics, micrographics, and run a plotter, too.



AGILE Corporation's 5287 series printer controllers are the **only** devices available to provide **both** RS232C serial and Centronics-type parallel interfaces for printers incompatible with IBM 3270 Cluster Controllers. That means you can plug in an AGILE 5287 and connect to any printer you choose . . . including the highest speed devices as well as the **least** expensive on the market! Now, you can replace IBM 3287/3289 printers in either a BSC or SNA/SDLC application with **any** printer. Connection is quick and easy, through an IBM standard coaxial cable as an IBM category "A" device.

AGILE's 5287 printer controller supports an RS232C serial, specificable protocol, interface up to 19.2K baud as a printer port. Also, the 5287 controller supports a standard Centronics-type parallel interface as a printer port. Parity and data rates are selectable, regardless which of the ASCII interfaces you use. Special Character Set (SCS) support is provided (according to the printer used), but no special programming support is required for non-SCS mode operation. Complete controller logic circuitry and the power supply are contained in the 5287's compact, low-profile enclosure. There's a complete front panel, too. The operator control panel is IBM 3287/3289 compatible, and the format and operation of front panel switches approximates IBM 3287/3289 functions and physically implements 3287/3289 switches and indicators. All software and applications programs that currently support the IBM 3287/3289 printers will directly support the AGILE 5287 controller as well.



The 5287 Printer Controller Interface models are type "A" devices and each includes case, front panel, and power supply. The 5287-2 provides the RS232C interface port, and the model 5287-3 provides the standard Centronics port. Other standard codes may require an NRE. All the details are available — right now — from AGILE, as is all the help. Most important, AGILE is providing the 5287 Printer Controller. Immediately. Use the coupon below . . . now . . . or call toll-free:

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Visa Installing System to Combat Fraud

By Bob Johnson
CW New York Bureau

NEW YORK — Visa U.S.A. has begun installing a nationwide system that it hopes will stem a rash of credit card losses and frauds that amounted to nearly $400 million last year.

The Loss Control System (LCS) will consist of 130 IBM Series/1 minicomputers residing at participating Visa member financial institutions across the country. Thirty-four banks and six card processing organizations will receive the computers as replacements of older equipment currently being used for transaction processing, David A. Huemer, senior vice-president for operations of Visa U.S.A., a subsidiary of Visa International, said.

Point-of-sale (POS) terminals will be installed in merchants' stores as part of the system. These terminals were produced in a joint effort as part of the pilot project undertaken by five different vendors in August 1980.

This phone-type device will read data from a magnetic stripe on the back of the credit card replacing the old dial-in method devices.

Using Cards

When a customer uses a credit card to make a purchase, the card's magnetic stripe will be read by the POS terminal, which will transmit the data to one of the participating minis (which Visa said can handle up to 1,000 dial terminals) via telephone lines.

The minis will then communicate with one of Visa's two main IBM 4341 CPUs, located either on the East or West Coast.

This information will be run through a data base containing the account file to determine whether the card has a negative standing. The main CPU then relays this information back to one of the member computers for card clearance or denial, which in turn is sent back to the proper POS terminal.

Notification Time Cut

Huemer said the LCS will substantially improve the credit card loss notification time, which can now take almost 18 days to be listed in a directory.

He also expects the system to be completed by the end of 1982, to save Visa members $60 million in its first full year of operation.

In New York, under the first phase of the LCS operation, Citibank, Chase Manhattan Bank, Chemical Bank, Banker's Trust and the Eastern States Monetary Services all have LCS computers installed, Huemer noted.

McHenry Gets Babbage Award For 1981-82

MINNEAPOLIS — William K. McHenry, recent recipient of a master's degree from the department of applied mathematics and computer science at the University of Virginia, has been awarded the 1981-82 fellowship of the Charles Babbage Institute for the History of Information Processing, the institute announced.

McHenry will continue his graduate work at the University of Arizona, where he is finishing his dissertation entitled "The Social and Economic Impact of Computing in the Soviet Union."

The fellowship is awarded annually to graduate students to promote research in the history of information processing, according to an institute spokesman.

Additional information on the fellowship and the institute is available from the Charles Babbage Institute, 104 Walter Library, 117 Pleasant St. S.E., University of Minnesota, Minneapolis, Minn. 55455.

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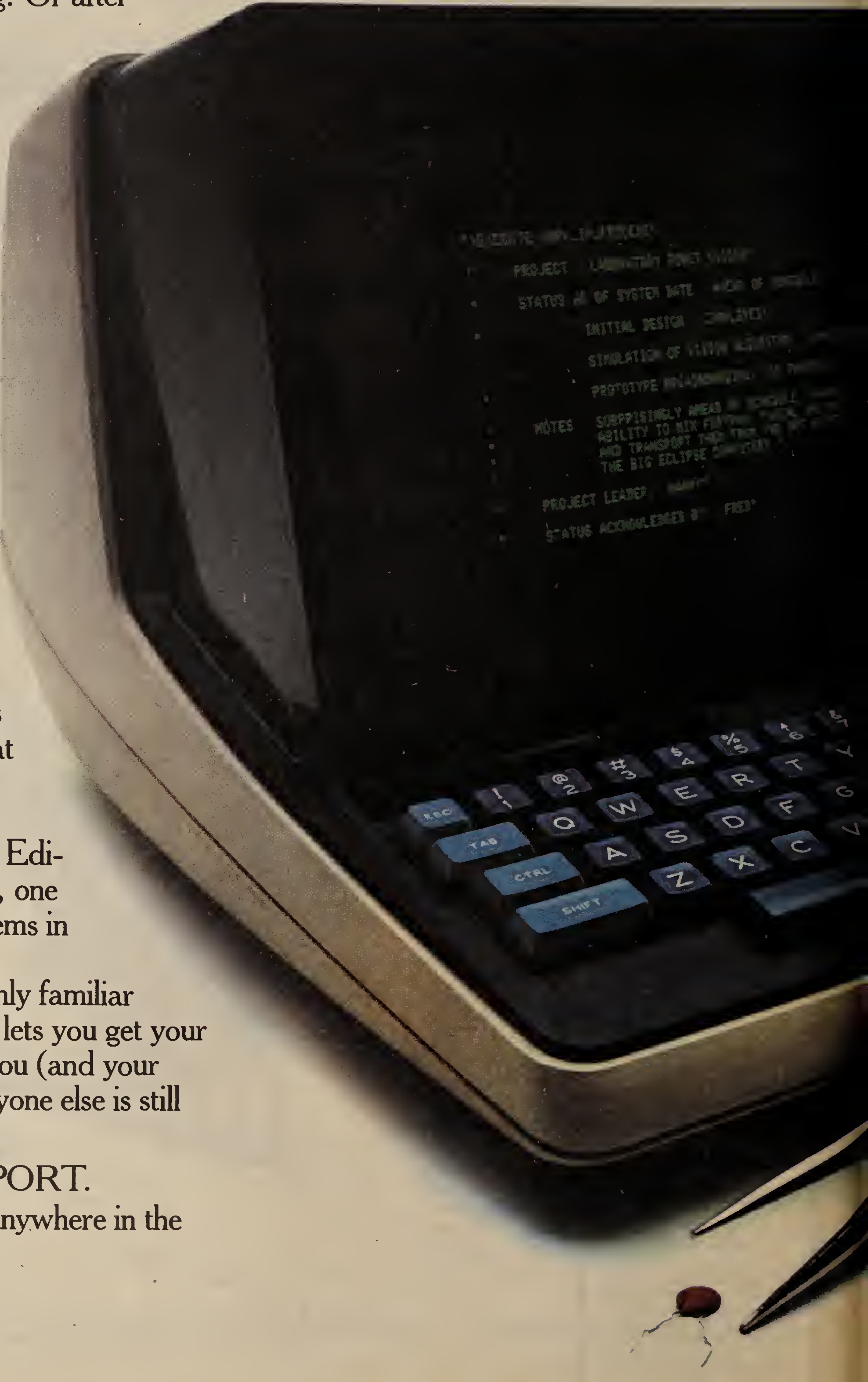

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We would suggest, however, that you ask us to send this information to your home.

Unless, of course, you're planning to use the MPT/100 to work on your hot new project at work.

MPT/100 computers are available for delivery from SCHWEBER, HALL-MARK, KIERULFF, ALMAC/STROUM and R.A.E. in Canada.

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Systems Manager William Sanders: Being in the Right

By Jeffry Beeler
CW West Coast Bureau

LOS ANGELES — William Sanders is one of those fortunate information systems managers whose career paths seem to have taken them to the right company at the right time.

In 1977, only about two years after he became Title Insurance and Trust Co.'s full-time systems chief, the firm launched an ambitious project to automate operations at all 300 to 400 of the company's U.S. branch offices, which have traditionally done their information processing manually.

The automation effort, to which Title's top executives have assigned one of their highest priorities, has suddenly thrust the firm's central computing department into the corporate limelight and has reportedly drawn the operation progressively deeper into the company's strategic planning and management activities. "Management recognizes that the future of our company and of our industry in general depends on being able to use information effectively," Sanders said. "Therefore, management views the organization that processes that information with a great deal of respect."

The push to automate Title Insurance's remote-site operations has also transformed Sanders into one of his employer's highest ranking and most influential executives.

As vice-president of management information systems (MIS), Sanders heads operations and data entry as well as systems development and maintenance activities for a corporate computing center whose staff totals 140 members and whose annual budget exceeds $6 million. Although Sanders devotes most of his management attention to Title Insurance and Trust, his responsibilities also extend to three sister organizations, including a financial printing business, a mortgage insurance company and a reinsurance firm.

Together, the four insurance and financial service corporations form a holding company known as Ticor Title Insurers, Inc., which in turn is owned by Southern Pacific Co. Thus, even though Title Insurance and Trust accounts for the largest chunk of Ticor's overall business, Sanders is technically considered MIS vice-president for the holding company.

Sanders, who reports to Ticor's executive vice-president of finance and administration, partly owes his lofty executive status to the good fortune of having gone to work for Title Insurance and Trust just as the firm was about to begin automating its offices in the field.

Threefold Objective

The objective in computerizing Title's remote-site functions is threefold. First, the firm hopes to cut its exisiting operations overhead and minimize future cost increases. Second, the firm aims to improve its customer service — a crucial requirement in an industry renowned for the remarkable uniformity of its competing companies and "products." Third, the organization seeks to provide its central mainframe with additional sources of marketing, financial and statistical information.

Historically, Title Insurance's various field locations have been allowed to operate "pretty much independently" of corporate control, and the company intends to preserve as much of that decentralized management style as possible, Sanders said.

But at the same time, the firm also wants to increase its ability to monitor remote-site activities and in so doing to create a "total information system that will enable top management to keep its finger on the pulse of operations," the MIS vice-president added.

'Smart Card' Users Form Association

NEW YORK — International banking representatives of seven European countries have formed an international association to establish and monitor common standards for the French-developed "smart card."

The plastic credit card contains a microchip combining intelligence and memory features to pay bills, buy merchandise and store financial information.

The cooperating countries have agreed to promote a uniform technology for the integrated microcircuit cards and their associated electronic system. The card will be tested in the U.S. later this year.

The countries participating in the cooperative effort are the UK, France, Belgium, Ireland, Luxembourg, West Germany and the Netherlands, and their association will be based in Paris.

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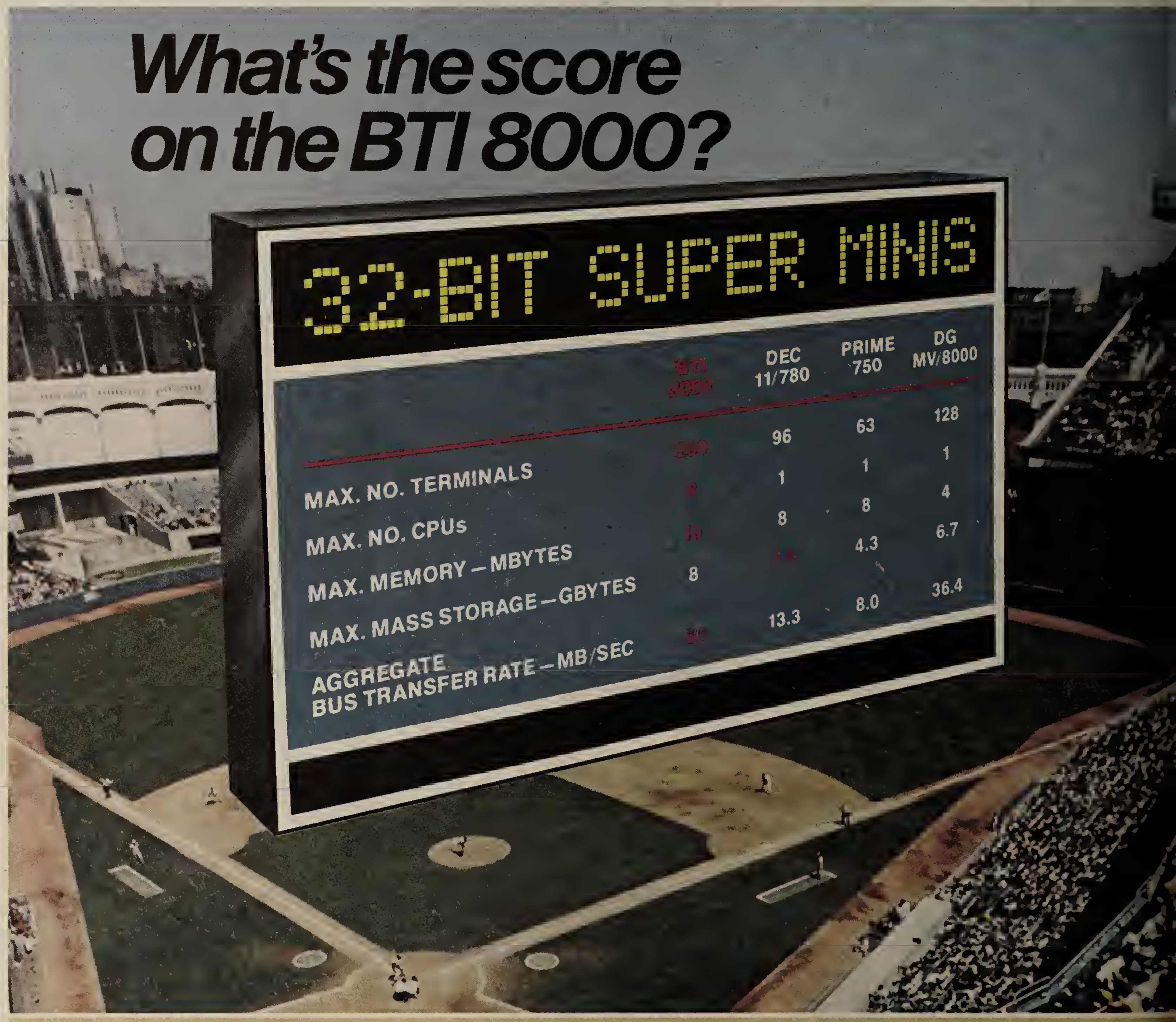

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MAX. NO. TERMINALS	[illegible]	96	63	128
MAX. NO. CPUs	[illegible]	1	1	1
MAX. MEMORY – MBYTES	[illegible]	8	8	4
MAX. MASS STORAGE – GBYTES	8	[illegible]	4.3	6.7
AGGREGATE BUS TRANSFER RATE – MB/SEC	[illegible]	13.3	8.0	36.4

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Place at the Right Time Reaps Rewards

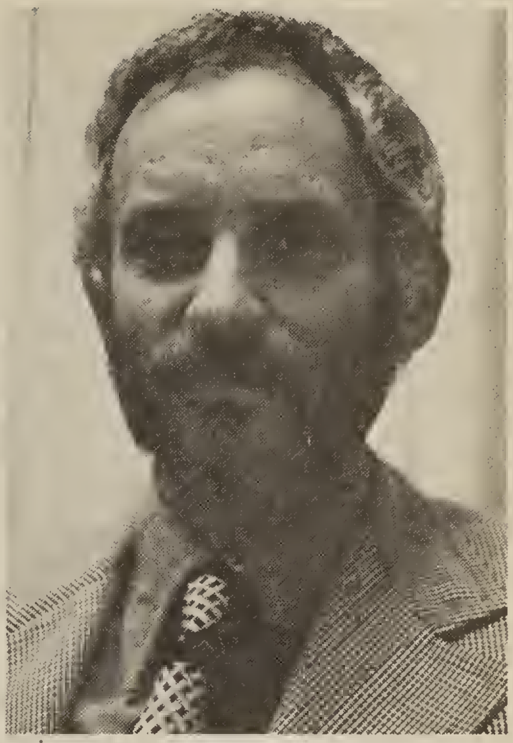
To coordinate the automation efforts of Title Insurance's various branch offices, the company recently added a Field Systems Division to its corporate MIS operation. The field systems group's main mission, Sanders explained, is to "prevent the firm's remote locations from reinventing the wheel and to make sure they automate functions consistently throughout the company."

Another factor that has reportedly played a key role in Sanders' rise through the executive ranks is his consuming interest in business and his seemingly natural bent for general management.

"I see myself primarily as a manager and a business person, not as a technician," he said. "Although I have a strong technical background, I also have a good grounding in finance and business, and I feel I'm able to bring a perspective to this job of more than just a DP manager."

Businessman, Not DPer

Sanders prefers to be viewed as a businessman who happens to run an MIS organization rather than as an information systems manager who happens to be a businessman. "I could see myself occupying management positions in many business disciplines other than just DP," he explained. "It just happens that my professional experience lends itself to running a DP organization because that's the career route I came up."


William Sanders

Sanders, 42, entered the computing field in 1961, the year after he graduated from Western (now Case Western) Reserve University with a B.A. degree in mathematics. His career began with IBM, where he worked for five years as a programmer, software designer and systems engineer.

In June 1966, he left IBM to join Computer Usage Co., the San Francisco-based consulting company, as a programmer/analyst and project leader for commercial applications development. Four years later, after a year's absence at a Los Angeles-based consulting firm known as Opner & Associates, Sanders was thrust into his first true management position when he became Computer Usage's southwest district manager.

But shortly after his promotion, Computer Usage, like many other software companies of the day, fell on hard times and was forced to shift its business emphasis from applications development to systems consulting. Sanders' new role as a management consultant took him in September 1971 to Title Insurance and Trust, where he held various systems positions while remaining on Computer Usage's payroll.

In July 1975, he left Computer Usage to go to work full-time for Title as the company's chief MIS officer. "I had developed a strong bond with the Title Insurance people and had been well received by them," Sanders recalled. "I felt it was the right company for me, and they felt I was the right person for them."

Spare Time Courses

In his spare time, Sanders has also taken several business and economics courses, done a lot of outside reading and managed the finances for two local retail stores, both of which are family owned. These extracurricular activities, coupled with his regular jobs, "have given me an awareness of the profit motive inherent in business and an ability to relate to that motive," Sanders said.

Why is an awareness of the profit motive so important for an MIS chief to acquire? "So much of what a computing department does is in support of those executives whose responsibility it is to make money for their company," Sanders said. "A manager of a support organization who can understand and identify with a profit-center chief's problems and objectives can do a much better job of earning that person's respect and cooperation than someone who is viewed merely as a technician and who can't speak the language of operating people."

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If you can't make one of these dates, others are now being scheduled for Los Angeles, Seattle, Hartford (CT), San Francisco, Atlanta and Denver. For details and dates, contact your nearest BTI Sales Office. Or call the BTI Seminar Coordinator at (408) 733-1122.

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Texas Landlords Tracking High-Risk Renters

By Lois Paul
CW Staff

HOUSTON — The days of "professional lease breakers" in this area are numbered now that the Houston Apartment Association (HAA) is using a computerized program to keep track of high-risk renters.

The Resident Credit Reporting Service currently is protecting up to 85,000 apartment units, William A. Harper, executive vice-president of HAA, explained.

The program was developed by Jim Madden, director of the Commercial Application Processing Co. It is written in Basic and runs on this firm's Qantel Corp. 1450-2 minicomputer system. The HAA uses Qantel terminals connected by a leased line to the system to run the program.

Basically, the program maintains information on all renters moving into or out of HAA-member apartment units. Resident managers send in move-in information on a specially designed form and this data is entered into the computer, Harper said.

When the resident moves out, a second form is mailed in, which describes the resident's history. At the top are four boxes that detail actions such as "broke lease," "skipped," "eviction" and "bad checks."

The resident manager enters a code number in these boxes. "If they are all zeros, that means the person left owing nothing. If there is a five in the fourth box, it means the person wrote five bad checks," Harper said.

The information about the potential tenant protects the apartment owner, who can refuse to rent to him unless or until his bills are paid and his credit is cleared.

Credit Bureau Unsatisfactory

For two years, HAA used a standard credit bureau to obtain information on tenants, but found this unsatisfactory.

"Our people that represent these apartment units felt an apartment resident will pay their water bill, gas bill, credit card, bank, savings and loan and not pay their rent. So they don't care about the other stuff. That's all they want to know," he said.

The problem for the rental industry, according to Harper, is that credit information about these four high-risk areas has never been in one place.

This is the reason the HAA went to the computerized program. "A group of owners got together to ascertain what could be done about lease breaking, skips and bad checks. And we're 21 years later still trying to solve the problem."

HAA hired the Commercial Application Processing Co. to develop the custom software two years ago. HAA then licensed use of the Resident Credit Reporting Service to the Credit Reporting System.

"The function of the HAA is to make sure owners are sending in move-in, move-out information," he said.

The Credit Reporting System sends one staff member to the 16 justice of the peace courts each month to obtain from their dockets records of all residents who have had evictions filed and a conviction rendered.

The program is financed through fees paid by the participating members of the HAA, a trade association that represents a total of 256,000 apartment units. The resident managers who subscribe to the program pay twelve cents per apartment unit per month.

Harper anticipates increasing the number of units represented from 85,000 to 125,000 by January. The program is "slowly gaining," Harper said, explaining that the rental industry always has lagged behind most other industries in terms of organization.

"Technically, it is an entrepreneurial kind of industry and, as a result, people have been reluctant to share management expertise with each other," he said.

He explained that a major push for this program arose in 1976 when one company that was managing 18,000 units had people skipping on one property and moving to another within their own company.

With the new computerized system, "we may not catch them the first shot out, but the second time we'll get him. And if we can do that, we're happy," Harper said.

Seminar to Explain 1980 Paperwork Act

WASHINGTON, D.C. — The Federation of Government Information Processing Councils will conduct a nationwide series of seminars on the implementation of Public Law 96-511, the Paperwork Reduction Act of 1980.

The seminars will be of interest to government and private sector computer professionals interested in the law and its impact on information resources management and long-range planning for information systems, according to the federation.

The price for the seminars is $110 for federation members who pay at least 30 days prior to the seminar and $120 for members who do not. Nonmembers pay $130 if registered 30 days in advance and $140 if not.

Dates and locations of the seminars are available from the federation at 12611 Davan Drive, Silver Spring, Md. 20904.

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Flexibility Proves Key to Microdata Reality 4000

By Hillel Segal
Special to CW

A highly efficient data base management system, the Microdata Corp. Reality System 4000 combines microcoded operating system firmware, virtual memory and an easy-to-use data retrieval language to provide a flexible multiuser system.

The Series 4000 is the first virtual memory system tested in this series of reports, and the results are impressive.

The operating system offers features and capabilities usually found on larger, more expensive systems. High reliability and ease of backing up large amounts of disk storage using the tape drive were seen as definite pluses. In addition, users surveyed rated the service received from Microdata very high.

The Series 4000 is the seventh system in the $25,000 to $50,000 range the Association of Computer Users (ACU) has reported on for *Computerworld*. ACU's independent consultants used a Microdata Reality Model R4510 consisting of a Model 1600 CPU with 64K bytes of central memory, a nine-track tape drive, a 30M-byte reflex hard disk drive, a 150 LPH printer and a Prism video display terminal.

The price of this system including seven additional parts (but without the additional terminals) and the system software is $50,495. Additional terminals are available at prices ranging from $2,500 (for one) to $1,900 each (in quantities of four or more).

As can be seen in the Scorebox, the Series 4000 order entry times were very impressive, ranging from 20% to 400% faster than other machines tested thus far.

SCOREBOX

System: Microdata 4000
Current Price: $42,700 with one terminal
$56,000 with eight terminals

OTHER BENCHMARK RESULTS
Test E-4

	CPU-Intensive 239.7 sec Time	Order Entry 3.4 sec Time
Wang 2200MVP	16.4 Sec	4.6 Sec
IBM Series/1	*	*
TI DS990 Model 4	135.2 sec.**	4.3 sec.**
Hewlett-Packard 250	***	***
DEC Datasystem 355	84.1 sec.	16.1 sec.
Alpha Micro AM-100T	To be covered in future issues	

* Programs could not be run properly due to a loss of characters in the order-entry processing.

** For programs run in Cobol; the respective times for Pascal are 68.1 sec. and 3.9 sec.

*** The 8-terminal test could not be run, as a maximum of 5 terminals can be connected. With 4 terminals, times were 47.6 seconds for the CPU test, and 2.3 seconds for the Order Entry test.

However, the same cannot be said of the CPU-intensive tests. These times — some of the slowest of all systems thus far reported — reflect the data base orientation of the system.

The results show that the machine was designed to optimize performance for interactive data entry and retrieval, but is not intended for "number crunching" applications.

The Series 4000 operating system employs virtual memory and reads in sections (or frames) of files from the disk. These sections are then operated on or executed. With this technique, user program size is not limited by available main memory, but can be written as if the memory were "virtually" unlimited.

Although a virtual machine makes efficient use of all available memory, a good deal of operating system overhead is required. When a program addresses a word that is not in the central memory, a page fault results. The system must then wait for the disk to read in the addressed word before continuing. As the number of page faults increases, the system must spend more and more time waiting for the disk I/O to complete.

The very fast order entry times obtained for this report are due in part to the fact that our application was not experiencing any page faults.

This is the 36th in a series of articles giving the highlights of benchmark tests conducted on popular small computer systems. The full reports were originally published by the Association of Computer Users, a 4,000-member nonprofit organization.

The program, which was shared by all terminals, was probably resident in memory for the entire test. Many users that we talked to were not operating in a fault-free environment and reported a notable slowdown in system speed as the number of page faults increased.

The virtual memory technique employed divides each program or data file into 512M-byte frames. One frame at a time may then be read into main memory and executed. When a location not presently in the main memory is addressed, the system reads a new frame into the memory and resumes program execution.

The files are organized so that files at one level point to multiple files at a lower level. This hierarchical file structure took a little getting used to, but was easy to understand with use.

The Series 4000 package includes a wide variety of data base management software, utility programs and an assembly language. The Terminal Control Language (TCL) provides the primary interface between the user and the system. The various utilities, processors and programs are invoked by entering simple TCL commands called verbs.

The languages supplied with the Series 4000 include a data retrieval/report generator called English and an enhanced version of the standard Dartmouth Basic called Data/Basic.

The compiled Data/Basic combines some of Basic's best features (variable length string variables, multiple statements on a line and so on) with those of Fortran (external subroutine calls, Common variable storage and so on). Data/Basic should be a fun language to program.

One feature highly rated by users was the English data retrieval language. This query language, with its "English-like" syntax (with nouns, verbs and modifiers) can be easily learned by the noncomputer-oriented business manager.

With English, the manager can query the data base in a variety of ways using searches, sorts and so on for any number of fields. Typical user comments included the following: "English is wonderful. I can train users in 10 minutes. It's what makes this computer." Most users felt that English more than made up for any program with system speed.

Proc Processor

Another excellent feature is the Proc processor. By using Proc, a complex series of operations can be stored and invoked later by entering a single-word command. With features like argument passing, terminal prompting and branching, Proc provides a powerful (though somewhat complex) tool for the user. More simplification would greatly enhance Proc.

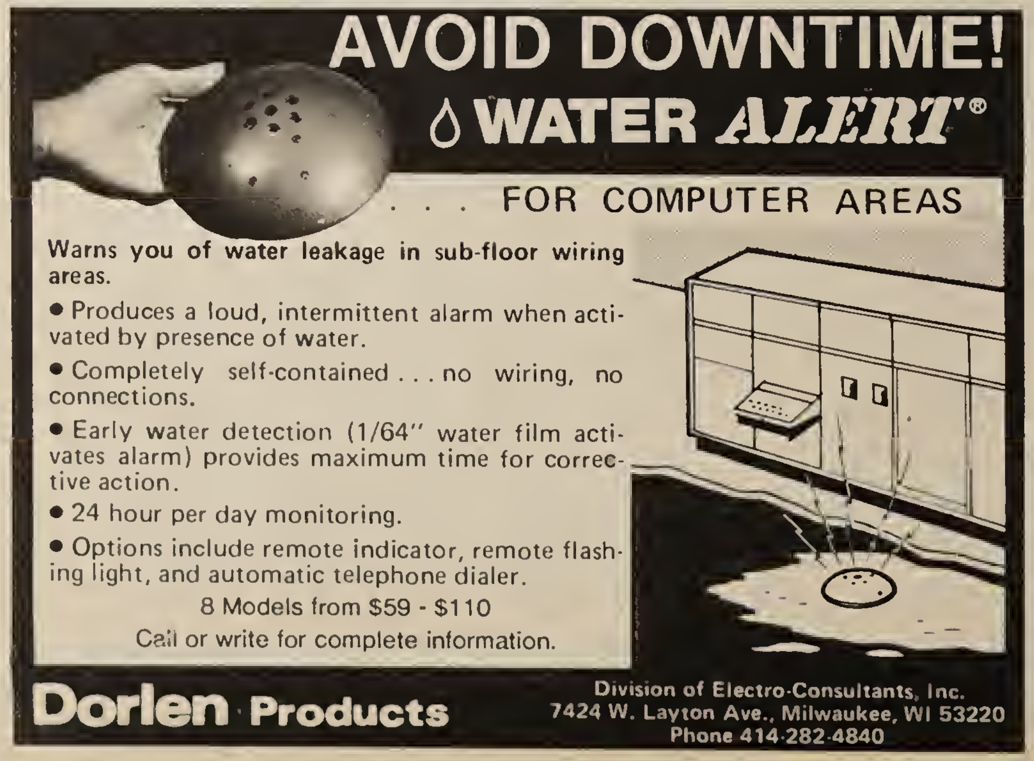
The tape drive unit provides the user with an easy, efficient method of backing up disk storage. The hard disk/tape drive combination was very popular with users.

One feature we liked was the ability to get information from the backup procedure, which analyzes the disk file allocations and reports inefficiencies. At the user's option, these files can be reallocated. Users especially liked the tape drive for its ease of use when backing up the disk.

Booting the Series 4000 is a simple procedure. The 4000 "senses" the available hardware and reports this information to the user. Thus, the system automatically does the system generation whenever a restore or boot-up is done. Whenever a power-up or "cold boot" is done, the system rearranges the files to "clear up" wasted empty file space.

Microdata offers a wide variety of options for the 4000. The Series 6000 upgrade kit provides 256K bytes of memory and 514M bytes of disk. The Series 8000 upgrade kit increases memory to 512K bytes with 514M bytes of disk and 48 ports.

Hillel Segal is president of the Association of Computer Users, a nonprofit association with members in the U.S., Canada and several other foreign countries. A package of information about the Association of Computer Users is available from the group at P.O. Box 9003, Boulder, Colo. 80301.



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$30 Million in Tickets On-Line

Boston Pursues Parking Offenders

By Bill Laberis
CW Staff

BOSTON — To the dismay of thousands of parking offenders, a computerized collection scheme has quickly righted what was a virtually useless parking fine collection system here.

In the last two months, the new system has burrowed into a $30 million stack of unpaid parking tickets dating back to 1973. City fathers, facing the worst fiscal crunch in Boston's history, are determined to collect the lion's share of this backlog.

Now scores of the area's parking offenders, who have long viewed the ticketing process as a minor inconvenience placed on their windshield, are receiving as many as a dozen demands for payment, the ghosts of parking sins past.

In addition, the city has reinstituted the Denver Boot program, whereby the cars of chronic parking violators are locked in place and released only upon payment of back fines.

'Good Chunk'

"Look, it's no secret that the city is facing some tough times fiscally, and these fines are a potentially lucrative source of cash for us," Robert Ellard of Boston's Office of Fiscal Affairs said. "It looks like we have a way now of getting a good chunk of what's out there."

Datacom Systems Corp., the service bureau handling the computerized notification and collection system for the city, has sent out more than one million payment notices for violations committed between 1973 and 1980. Officials said another 1.3 million notices have still to be mailed for offenses committed since January 1980.

"If you want to know how bad things were before we modernized, you have to realize that we formerly had collected fines on about 300,000 tickets over a one-year stretch and hadn't even been able to match the ticket with the offender with our old off-line system," Eugene Levine, executive secretary of the Boston Municipal Court, said.

The present system automatically sends a ticket directly to the offender's home, so the "It must have blown off my windshield" excuse is no longer justification for delayed payment.

In addition, the system has the capability of mapping out the parking patterns of chronic violators, making their cars more susceptible to the city's again-busy fleet of tow trucks.

But the greatest fine collection economies have resulted from Datacom's rapid processing capabilities, along with the company's on-line interface with records of the Massachusetts Registry of Motor Vehicles.

The registry is also mandated to not renew the license or auto registration of anyone who refuses to pay back fines.

"Datacom will be putting up over 10 million old records on a system that will be completely on-line [soon]," Levine said. "The big thing for us is we can now generate current offender lists so we know once again who to tow and who not to tow."

At present, the city will tow a car whose owner has five or more unpaid parking violations. The tow program was suspended for more than a year prior to the new system start-up because the city could not produce a current list of who had paid their tickets.

OCRUA Elects Three To Directors' Board

HACKENSACK, N.J. — Three new members have been elected to the board of directors of the Optical Character Recognition Users Association (OCRUA).

Those elected were H. Richard Church of National Data Corp., Robert Montgomery of First National Bank in Dallas and Roy Van Denburgh of IBM. Richard F. Burns of the Michigan Department of Social Services was reelected.

Officers elected by the board include Burns as president; Herbert F. Schantz of Graham Magnetics, Inc. as vice-president; Church as treasurer; and Sally J. Williams of Input Systems Associates, Inc. as secretary.

The membership services committee will be chaired by Montgomery. Williams will serve as chairwoman for the 1982 Expo.

OCRUA can be contacted at 10 Banta Place, Hackensack, N.J. 07601.

Security Course Slated for Fall

SAN FRANCISCO — Golden Gate University is offering a 10-course program in computer security starting Sept. 9 and ending Dec. 19.

The courses will focus on data programming, corporate security and the legal and regulatory implications of existing and proposed state and federal legislation. It was designed for data processing and data security professionals, the university said.

Each course is worth three semester units of academic credit and tuition per unit is $75. The school is located at 536 Mission St., San Francisco, Calif. 94105.

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Study Launched on Home Information Systems

By Tim Scannell
CW Staff

NEW YORK — Booz-Allen & Hamilton, Inc. has launched a multimillion dollar study to find out how much of an impact home information systems (HIS) will have on industry and the general public.

Structurally the same as Teletext, Telidon and other two-way interactive systems, HIS is described by some analysts as a natural progression from distributed data processing because it involves similar technological building blocks — communications, data bases and software.

Like DDP, such systems were designed to bring computer power to individuals at a multitude of scattered sites.

The year-long study, which officially begins this fall, will involve about 800 homes in New York, Columbus, Ohio and San Diego. Sponsors of the project include such firms as AT&T, CBS, Cox Cable Communications and IBM, according to Michael J. McLaughlin, a Booz-Allen vice-president who is heading the study.

Central to the project is a unique laser disk and computer-based information system that will allow participants in the study to access and utilize many of the services that will be available in a HIS network.

Apple Micro

The system consists of a 48K-byte Apple Computer, Inc. microcomputer, a standard television set with a touch-sensitive screen and a laser disk video player.

By calling a menu up on the screen and touching specific categories and items, a user can reportedly do everything from completing bank transactions to ordering movie tickets.

One industry that stands to be hardest hit by such home-based systems is the banking and financial sector, especially in the area of check processing.

Using terminals in the home, consumers can conduct banking transactions without writing checks or handling paper. In fact, HIS could eventually handle half the U.S. daily check load, according to Robert Grant, a Booz-Allen vice-president.

Presently, about 32 billion checks are processed yearly in the U.S., a figure that is estimated to jump to 45 billion by 1985, a 1980 Arthur D. Little, Inc. study said.

While Booz-Allen's HIS is similar to other experimental two-way computer-based systems, like Teletext, these test systems have been limited in the number and sophistication of services and the number of customers, McLaughlin stated.

The Booz-Allen venture is, thus far, the only one that has involved a range of companies from industries that have the most potential to be impacted by HIS.

Basically a nonentertainment service, HIS has a potential yearly revenue of $15 billion to $25 billion, a sum roughly equivalent to today's residential telephone market, the New York-based consulting firm estimated.

Video Course Available On Structured Data Base

NEWTON, Mass. — A video education series on structured data base analysis and design is available from Eastern Technical Associates, Inc. (ETA).

The course addresses the role of data administration in the data processing organization and attempts to answer such questions as: How does data administration support the application development team in analysis, design and implementation?

What specific information does data administration need from the application development team to logically and physically design a data base? How does an organization establish a long-range data base design plan and work toward it?

The lectures are administered by Thomas F. Meurer, president of ETA.

The licensing fee for the course is $2,900 plus shipping charges. Further details are available from ETA at 189 Wells Ave., Newton, Mass. 02159.

Aronofsky Wins Uren Award

DALLAS — Julius S. Aronofsky, professor and chairman of Management Sciences and Computers at Southern Methodist University here, will receive an award given by the Society of Petroleum Engineers for outstanding professional and technical contributions.

The society's Uren Award recognizes Aronofsky for his pioneering achievements in the use of digital computers. The award will be presented to Aronofsky at the society's Annual Technical Conference and Exhibitin in San Antonio, Texas on Oct. 4-7.

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Classes Offered On IBM's IMS

PALO ALTO, Calif. — A series of classes on data base technologies related particularly to IBM's IMS is being offered by the Professional Services Group of Informatics, Inc.

Subjects include basic and advance IMS programming, data base design, programming for Message Format Service and IBM's Application Development Facility.

Up to 15 students can be taught at one time in a customer's facility. Fees range from $1,500 for a one-day course on the fundamentals of IMS/VS to $17,500 for a nine-day master course for advanced programmers.

Informatics, Inc. is located at 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

Victim of DP Mailing Lists

Henry Thoreau Behind a Buick Skylark?

By Bill Laberis
CW Staff

CONCORD, Mass. — It was, at first glance, a seemingly innocuous brochure from a local Buick dealer. But it was addressed to the philosopher who believed that anyone who traveled faster than walking was missing something.

It read: "Dear Mr. Thoreau: As you read through this brochure, you will sense the enthusiasm we have for the all new 1980 Buick Skylark. Come in and test drive one soon. It might just be the perfect car for you."

Writer, philosopher and proselyte of the life unencumbered by superfluous conveniences, Henry David Thoreau once remarked that nothing worthwhile ever arrived in the mail. Yet his name lives on, for better or worse, both in the hearts of his apostles and in the electronic netherworld of computerized mailing lists.

It seems the Thoreau Lyceum, a learning center here, has business accounts with many major publishers, some of whom have sold or swapped their mailing lists with other companies. Now a certain "Mr. Thoreau of 156 Belknap St., Concord," dead for more than 100 years, has been repeatedly mailed the promise of the American Dream.

"It's humorous on one hand, but I dare think Thoreau himself would be rather disgusted by the whole thing," said Mrs. Thomas W. McGrath, curator of the Thoreau Lyceum. "The things we get addressed to Mr. Thoreau are not exactly fit for the man he was. The problem is the computer really doesn't know any better."

But the computer's ignorance would have been little solace to a man who spent two reclusive years in a humble, lakefront hut, experimenting with a totally natural lifestyle. Consider the package mailed him by *Reader's Digest*.

"How would you, Mr. Thoreau, like to build a new home in Concord's best neighborhood — complete with swimming pool?

"A Cadillac, Mr. Thoreau — It could be you!" the *Digest* contest come-on continued. "A limousine could pull up in front of 156 Belknap St. and you and your entire family would be chauffeured to Logan International Airport.

"Now imagine returning to Concord with $100,000. You could pay all your bills and still have plenty left over to treat the entire Thoreau family to some *pretty fancy luxuries!*"

Ironically, the *Reader's Digest* was recently slapped with a $1.7 million fine for violating a Federal Trade Commission consent order restricting the publisher's promotional practices.

No Bargain

It was Thoreau who said the worst reason for buying anything is because it is for sale. It was also Thoreau who cautioned people to beware of occasions requiring new clothes, Mrs. McGrath said.

However, that warning did not stop Brooks Brothers, the famous haberdashers, who wrote Thoreau saying they feel the aesthetic thinker "is definitely the kind of person who would appreciate" their new clothes. Nor did it stop another maker of men's double-knit pants who tried to lure Thoreau into providing his waist size for a complimentary pair of trousers.

And the American Express people told Thoreau he is the kind of man who should *never* leave home without his gold charge card.

"Living beside Walden Pond for those two years, Thoreau developed some pretty definitive ideas on how life should be lived," Mrs. McGrath said. "Somehow these consumer invitations miss the mark with him in the biggest way."

Introducing the First Annual "Computerworld" for Television Computer Graphics Contest.

We are looking for interesting, entertaining and creative computer-generated graphics which we can display on our weekly TV newsmagazine "Computerworld," now being shown in 13 major markets around the country.

If you have been involved in the design of any such graphics and would like to see them displayed on TV, then we encourage you to enter them in our contest. Individuals, groups or corporations are allowed to enter. If your entry is chosen as one of our semi-finalists, it will be shown during one of our programs between features, and you or your organization will be given appropriate credit.

Rules and entry information:

We've tried to make things as simple as possible. Basically anyone can enter. You need to have a computer-generated graphic of about 5 to 10 seconds in length (longer is OK if it can be cut into short segments), and you need to be able to submit it either on 16MM film or any standard format videotape (from Beta or VHS to U-Matic to two-inch). Unfortunately we cannot accept entries in any other format (computer instructions on disc or tape are unacceptable, for example).

"Still" graphics generated by computer and then put into "motion" with standard animation techniques are acceptable when submitted on one of the forms above, as are graphics which involve other manual intervention to enhance the computer's work.

Entries will be judged by "Computerworld's" producers on the basis of originality, entertainment value, artistic merit, suitability for broadcast, interesting or unusual use of computers in development and overall "impressiveness". Decision of the judges is final.

By entering, you attest that you possess full rights to the graphic being submitted, and you thereby grant rights of broadcast as described above to CW Broadcasting, producers of "Computerworld." You also attest that the people or organization listed as designer/creator of the entry are, in fact, the true creators/designers. (If you purchased graphics from another firm, list the firm responsible for the purchase as well as the firm which supplied the graphics.)

Entries must be sent to:

Computerworld TV Graphics Contest
Box 880
Framingham, MA 01701

Entries will be returned. Deadline for entries in this first contest is December 31, 1981. Entrants may be selected as semi-finalists before all entries are submitted. Finalists will be selected from semi-finalists after all entries have been submitted. Finalists will receive a certificate from CW Broadcasting.

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ENTRY FORM (A separate sheet of paper containing following information may be used.)

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— Alphonse Karr (1849)

Part 6 . . .

Herman Hollerith: Punched Cards Come of Age

By Marguerite Zientara
CW Writer/Analyst

There is irony in the current delays surrounding issuance of the reports and computer tapes from the 1980 census — the most thorough decennial enumeration in the nation's history.

A century ago, it was just such delays in the 1880 census that led to the use of punched cards in census taking — a giant-step innovation in the history of the census and of the electronic computer, which now tallies the census.

While the delays of 1880 stemmed from a lack of sophisticated technology, the delays of today are born of the excesses of a technology that has finally come into its own.

A hundred years ago, thousands of human beings manually counted the census results of 1880. No matter that the workers were diligent; the task took seven and a half years, by which time the figures were close to useless.

During those seven and a half years, a young Census Bureau engineer, Herman Hollerith, attacked the problem of statistical tabulation. Through trial and error, diligence and a fateful conversation, Hollerith — echoing Charles Babbage's plans to use Jacquard loom-inspired punched cards for the Analytical Engine — set in motion a technology that would change the world.

No Illustrious Beginning

Herman Hollerith was born in Buffalo, N.Y., on Feb. 29, 1860, the son of German immigrants. The only noteworthy situation in his childhood was an immense dislike for spelling. It is said that, in an effort to avoid a spelling lesson, he once leaped from a second-story window and ran home. Hardly an illustrious beginning.

Nevertheless, Herman was gifted in other areas and finished his lower schooling under the disciplined tutelage of a Lutheran minister. Hollerith graduated from Columbia University's School of Mines in 1879 at the age of 19.

At Columbia, Hollerith's work had drawn the attention of one of his instructors, Prof. William P. Trowbridge, who was also a chief special agent for the census of 1880. Trowbridge recruited Hollerith for the census, where he went to work in October of the year he graduated.

It was Hollerith's association with his superior at the census, John Shaw Billings, that led directly to the idea for a punched card tabulator. Billings, an assistant surgeon in the U.S. Army, was a gifted administrator who had been sought out by the Census Office, although he never was on its payroll.

Billings was in charge of the work on vital statistics for both the 1880 and 1890 censuses — specifically, the collection and tabulation of the data. And it was Billings' suggestion to Hollerith that Jacquard-like punched cards might be the answer to the massive tabulation problems of the census.

Two Versions

As with so many significant events in history, there are two versions of how the seed of the idea was planted in Hollerith's mind. One has Billings and Hollerith strolling through the office where the 1880 returns were being manually tabulated by hundreds of clerks.

Billings reportedly said to Hollerith, "There ought to be some mechanical way of doing this job, something on the principle of the Jacquard loom, whereby holes in a card regulate the pattern to be woven."

Another version, written by Hollerith in 1919, has the two sitting at Billings' tea table on a Sunday evening, with Billings making the same suggestion.

Whatever the actual setting was, Hollerith later recalled, "after studying the problem I went back to Dr. Billings and said that I thought I could work out a solution for the problem and asked him if he would go in with me. The doctor said he was not interested any further than to see some solution of the problem worked out."

What does seem clear to all who have written about the incident is that Billings was the source of the idea and Hollerith the implementer. It would be a few more years, however, before the project would come to fruition.

In September 1882, Hollerith temporarily took leave of the Census Bureau to accept an invitation to teach mechanical engineering at the Massachusetts Institute of Technology. Gen. Francis Walker, also from the Census Bureau, had become president of MIT and had extended the invitation.

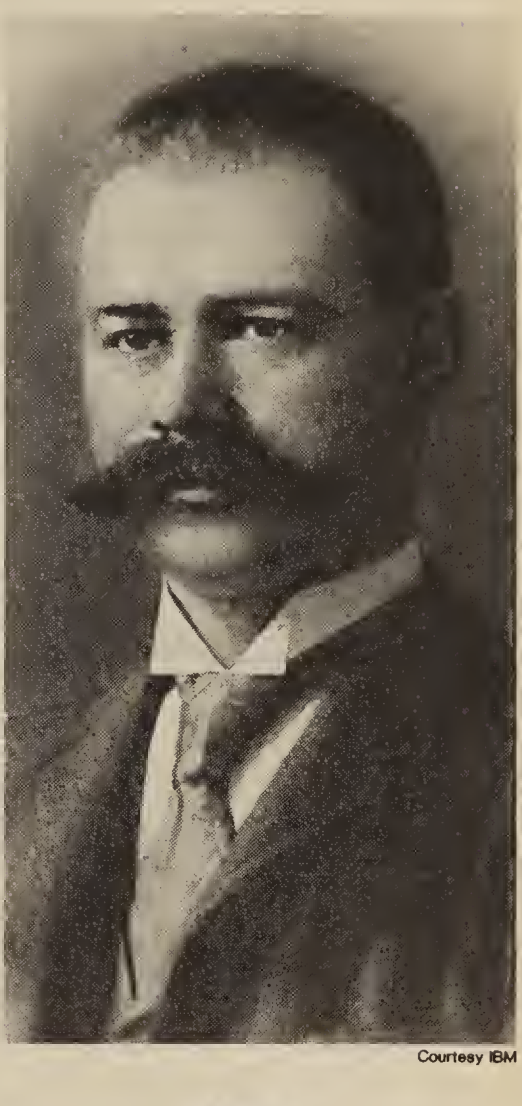
"While at Boston I made some of my first crude experiments in tabulating machinery," Hollerith wrote. "My idea at that time was to use a strip of paper and punch the record for each individual in a line across the strip.

"Then I ran the strip over a drum and made contacts through the hole to operate the counters. This, you see, gave me an ideal automatic feed," he noted. "The trouble, however, was that if, for example, you wanted any statistics regarding Chinamen," Hollerith said, reflecting the mores of the time, "you would have to run miles of paper to count a few Chinamen."

Hollerith claimed that a major breakthrough in his work came from his observation of a train conductor, who hand-punched tickets to record basic descriptions of his passengers. Hollerith felt the same technique could be used to record the proper census statistics for each individual in the U.S.

Hollerith continued his experimental work in St. Louis after a year of teaching at MIT. After a few months

(Continued on Page 35)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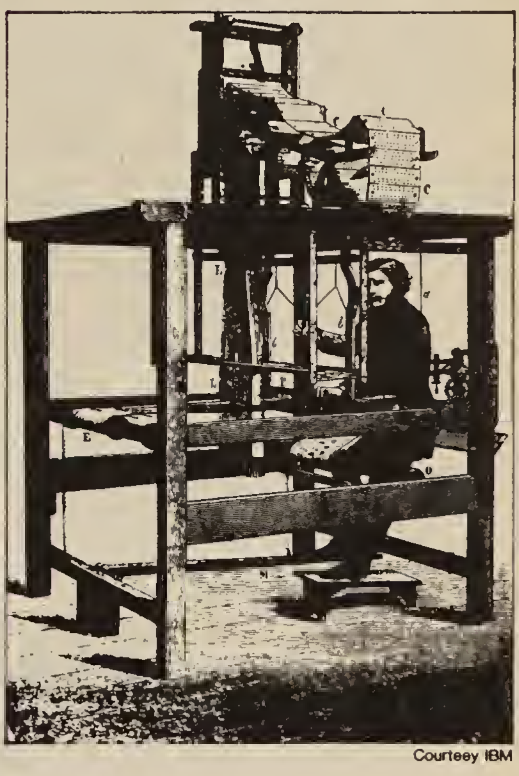
Courtesy IBM

Sketch of Jacquard Loom Cards Guiding the Pattern on a Weave of Cloth About 1810 in Lyons, France

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The Japanese market

The Japanese domestic computer market is the world's second largest. Every year, billions of dollars worth of yen are poured into the lease or purchase of computers and peripherals. And the market has been growing at up to 38% annually.

This huge market is dominated by the large Japanese manufacturers, such as Fujitsu and Hitachi, and by IBM. Together, they hold 80% of it. It seems like an absolutely unassailable share.

And yet, without question there *is* room for new companies — particularly American ones. This is partially due to the projected growth of the market. It is also due to the fact that American computers still represent the state of the art around the globe. That goes for Japan, too. And although it may surprise you, the Japanese are the first to admit it.

Moreover, in Japan American computers enjoy the image of superior quality that American technology — and especially American computer technology — benefits from the world over.

And yet American manufacturers — except IBM — have made few inroads. Why?

Doing business in Japan

If you have ever tried to export to Japan, you know how difficult it is. The Japanese import laws are complicated. But much more important is that the way of doing business in Japan is very different from that in the United States. The Japanese tend to do business only with people and companies they've known for some time. Or with companies introduced through a trusted third party.

For all of these reasons, chances are that you cannot bring your own equipment into Japan and share in the lucrative Japanese computer market.

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More about CLC

But before you do that, you may want to know a little more about us. Fair enough. Our full name is Computer Leasing Corporation, and we are based in Tokyo. We were started and owned by Itel until they decided to pull out of computers two years ago. Now we are part of the Kyowa Bank group. We had sales of $16.4 million over the past year, and are projecting sales of $22.1 million for this year, a growth rate of 35%. We have over ten years' experience marketing and servicing the entire lines of several manufacturers — including IBM.

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(Continued from Page 33)

in St. Louis, he returned to government work in the summer of 1883, for the Patent Office — a short-lived position from which he resigned on March 31, 1884.

Devoting his efforts wholeheartedly to the construction of his statistical tabulating system, Hollerith within six months applied for a patent — on Sept. 23, 1884. Five years later, on Jan. 8, 1889, three more patents were issued to him. Hollerith eventually accumulated a total of 31 data processing patents.

Three Events

In 1890, three major events happened in Hollerith's life: He married the daughter of Dr. Billings, he received his doctorate of philosophy from the School of Mines for his dissertation on "The Electric Tabulating System" and the U.S. conducted its eleventh census — using his system.

Before being awarded the contract for the 1890 census, Hollerith had competed with three other proposed systems, all of which took about eight times as long as Hollerith's to tabulate the results. In addition, Hollerith's was about twice as fast as his nearest rival in total time spent transcribing onto cards and tabulating.

The contract was an important factor in Hollerith's future financial success. And, as he characterized it, "it was indeed a brave act on the part of [Census Superintendent Robert P.] Porter to award me a contract for the use of the machines in compiling the census. Where would he have been had I failed?"

Hollerith need not have worried. Just one month after all the 1890 census returns arrived in Washington, the bureau announced the total population count of 62,622,250 on Dec. 12, 1890. Although the population of the country had grown from 50 million to 63 million since the 1880 census, the complete 1890 analysis was completed in 2½ years, one-third the time taken previously.

In an 1891 paper on the subject, Porter stated, "The Eleventh Census handled the records of 63,000,000 people and 150,000 minor civil divisions. One detail [characteristic] alone required the punching of one billion holes. Because the electrical tabulating system of Mr. Hollerith permitted easy counting, certain questions were asked for the first time. Examples of these were:

Number of children born.

Number of children living.

Number of family speaking English.

"By use of the electric tabulating machine, it became possible to aggregate from the schedules all the information which appears in any way possible," Porter continued. "Heretofore, such aggregations had been limited. With the machines, complex aggregations can be evolved at no more expense than the simple ones."

The *Electrical Engineer* had this to say: "This apparatus works unerringly as the mills of the gods, but beats them hollow as to speed" (Nov. 11, 1891).

Besides such verbal praise from all sides, Hollerith received several prizes for his invention. The Committee on Science and the Arts of the Franklin Institute of Philadelphia awarded him the Elliott Cresson Medal, its highest award. Of particular pride to him were the Paris Exposition Medaille d'Or and the Bronze Medal from the World's Fair of 1893.

What exactly was the system that revolutionized census-taking and eventually much, much more? As a refinement of his continuous paper strip, Hollerith decided to begin, instead, with separate cards on which clerks manually punched holes corresponding to certain characteristics of the citizens who had been interviewed.

First Use

His first use of the system, for vital statistics for the City of Baltimore in 1887, made use of cards measuring 3¼-in. by 8⅝-in., with three rows of 32 punch positions across the top of the card and three rows across the bottom.

The card used for the 1890 census was two inches shorter, but the same width — corresponding to the size of the dollar bill — with punch positions occupying the whole surface of the card. Of the 24 columns of quarter-inch squares (288 in all), the four columns at the left were reserved for geographic identification.

One type of machine was used to punch the 240 spaces comprising the body of each card, and a second, known as the "gang punch," punched several cards at once, for the geographic identification section.

Courtesy Carpenter Center for the Visual Arts, Harvard University

Ellis Island immigrants circa 1890. The influx of Europeans into the U.S. caused a 13 million jump in population between 1880 and 1890.

Once punched, the cards were read by placing them in a "pin press," which contained a mercury cup beneath each position where a hole might occur in a card. A hinged lid was closed, carrying a spring loaded "pin" or plunger corresponding to each mercury cup.

If a hole had been punched, the pin passed through it to make electrical contact with the mercury in the cup below. If there was no hole, the card held the pin back and no contact was made. Between 50 and 80 cards a minute could be passed through the pin press.

Hollerith is said to have borrowed the electromechanical technology that had been developed in 1858 by Emile Baudot for the electric telegraph and used electromechanical counters to count the number of cards with a particular perforation. The tabulator's 40 dials allowed the answers to several questions to be counted simultaneously.

To avoid false counts or skipping an incorrectly punched card, the circuits were arranged to ring a bell each time a counter registered a card. The cards that did not ring the bell were laid aside for further investigation.

An electromagnetically controlled sorting slot separated selected cards.

The sorter had a box containing 24 bins, each with a lid held closed by

(Continued on Page 36)

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(Continued from Page 35)

an electromagnetic latch working against a spring. When a hole was sensed, an electric current flowed that turned off the latch, allowing the spring to open the lid. The card was then dropped into the open bin by hand.

At the end of each day, the total on each of the 40 dials was recorded by hand and the dial was set back to zero.

A crucial ability of the system was that of sorting numbers of cards according to a given characteristic. In a few sorts one could determine, for example, how many people out of a northern population were white.

The machine was extremely reliable, although there were occasional mechanical failures. However, in the words of one operator: "The trouble was usually that somebody had extracted the mercury from one of the little cups with an eye dropper and squirted it into a spittoon, just to get unneeded rest."

Recognizing the commercial value of his invention, Hollerith set up the Tabulating Machine Co. in 1896, which manufactured both machines and cards at a plant in the Georgetown section of Washington, D.C.

The results of the American experience impressed the world, and it was not long before Hollerith's system was being used in Canada and Austria and being tried out in Italy, France and Germany. Hollerith even managed to get a contract with Russia for its first census, taken in 1897.

His equipment was used again for the Twelfth U.S. Census in 1900, this time on a rental basis. During the 1900 census, Hollerith developed an automatic tabulating machine, into which cards were fed automatically rather than by hand.

Also during the 1900 census, Hollerith turned his attention to the statistics of agriculture, soon realizing that a faster method of sorting was required to keep ahead of the tabulating machines. Rising to the challenge, Hollerith devised the first electric sorting machine.

In spite of his innovations, it was during the 1900 census that Hollerith's relationship with the Census Bureau deteriorated; it would be his last census. One portent came when Agriculture Chief Dr. L.G. Powers charged that the Hollerith equipment had resulted in the census' costing twice as much as it would have using hand work and adding machines.

Then in 1903, S.N.D. North became the first Director of the Census, following passage of the Permanent Census Bureau Act. It was not long before North and Hollerith had a disagreement over the rental charges for Hollerith's machines.

North was determined to improve Hollerith's equipment — independently. He received a $40,000 Congressional appropriation, set up the Census Machine Shop and hired as its director an obscure statistical engineer from New Jersey.

James Powers was the engineer and he proved to be an excellent choice. Under his leadership, the laboratory produced several refinements of Hollerith's machine. One feature was counters that automatically recorded the tallies, eliminating the need to manually read the dial faces.

Powers' approach differed from Hollerith's in that he wanted to build mechanical, rather than electromechanical, machines. In 1908, he introduced the "simultaneous punching" concept in which all the data to be placed on a 20-column card was entered on a keyboard, then, by pressing a punch key, the operator punched all the holes at once.

This guaranteed that partially punched cards could not enter the system and also allowed operators to check the data before operating the punch. Powers also developed mechanical sorters and tabulators that proved very reliable.

So pleased was North with Powers' accomplishments that he purchased 300 punches and related sorters and tabulators for the 1910 census. Soon after, Powers — who had retained the right to patent any machine he developed — left the census and in 1911 formed the Powers Accounting Machine Co., which became the census' major source of equipment.

Years later, Hollerith expressed his disappointment: "I always have re-

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In 1911, Hollerith's 15-year-old Tabulating Machine Co. merged with the International Time Recording Co., the Dayton Scale Co. and the Bundy Manufacturing Corp. to form the Computing-Tabulating-Recording Co. (CTR).

CTR, a holding company, was renamed the International Business Machine Corp. in 1924. In 1933, IBM was reorganized and became an operating corporation.

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gretted that I could not stay in census work long enough to carry out my ideas regarding verification machines."

Hollerith did, however, branch out into other markets for his equipment. His machines were used, for example, by the New York Central and Long Island railroads to audit freight statistics, a method that came to be adopted by other railroads.

A large machine tool manufacturer, in a portentous application, used Hollerith's tabulating machine to compile costs, analyze the payroll and keep track of materials in order to carry a perpetual inventory.

A wholesale house with eight departments carrying 33 classes and 170 subclasses of merchandise used the systems to get classified information on sales, including source, salesman, kind of merchandise, cost and selling price, salesmen's commissions, individual customer, territory and other factors adding to a firm's gross profit.

In addition, a fire insurance company — using the system for analysis and classification work — was able to determine amounts at risk, premiums received and losses paid on its several hundred classes of insurance.

Hollerith's last involvement with the Census Bureau was in the form of a law suit filed by the Tabulating Machine Co. in 1910 against the agency, claiming that, in remodeling the Powers machines, the census had infringed on some of Hollerith's patents. The suit was disposed without significant action.

In 1911 — the year Powers Accounting Machine Co. formed — Hollerith's 15-year-old Tabulating Machine Co. merged with the International Time Recording Co., the Dayton Scale Co. and the Bundy Manufacturing Corp. to form the Computing Tabulating Recording Co. (CTR).

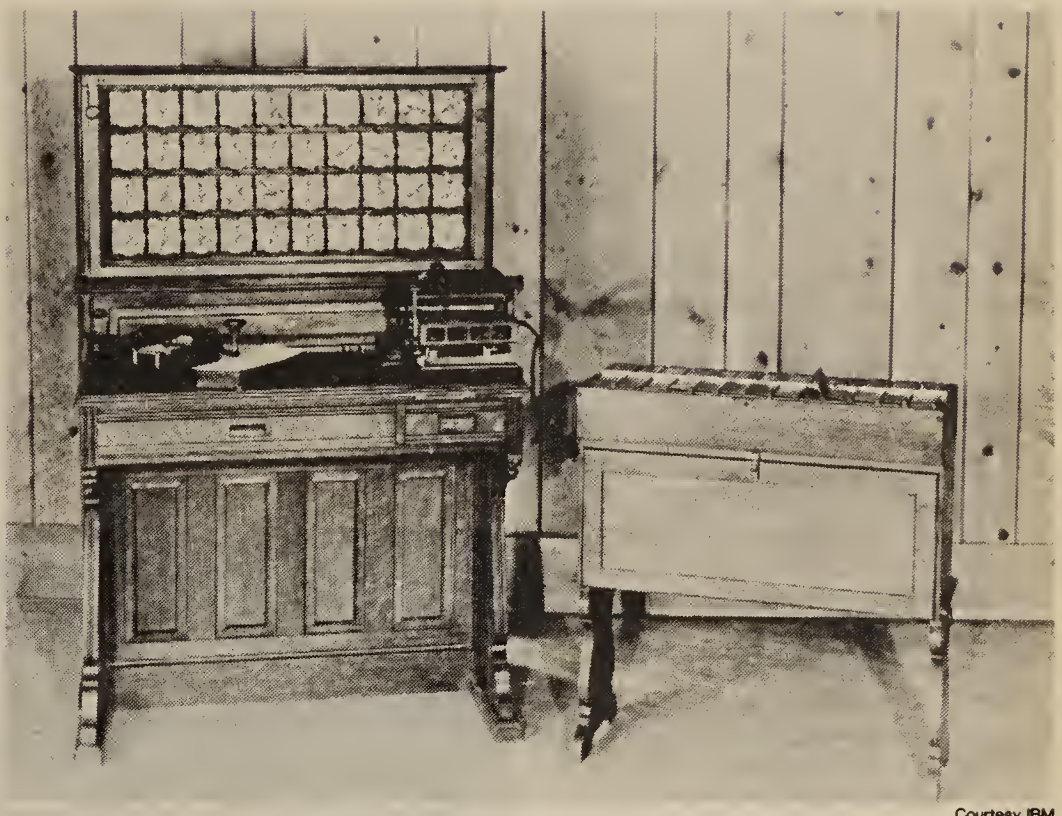
CTR, a holding company, was renamed the International Business Machine Corp. in 1924. In 1933, IBM was reorganized and became an operating corporation.

In 1927 the Powers Accounting Machine Co., through a series of business consolidations, became the Tabulating Machines Division of the Remington-Rand Corp., which in 1955 merged with Sperry Gyroscope to form the Sperry-Rand Corp.

While one might have expected Hollerith's and Powers' firms to remain competitive for many years, it is doubtful that many could have foreseen just how gigantic each was to become. The companies started by two punch-card pioneers would evolve into two of the most significant computer manufacturers from 1950 on.

Hollerith, who received his last patent in 1919, remained associated with CTR until 1921. Even in 1923, he wrote of plans to develop a tabulator similar to those later in use. Unfortunately, illness did not allow Hollerith to realize his plans.

On Nov. 17, 1929, in Washington, D.C., a heart attack took the life of Herman Hollerith at the age of 69. His contribution to statistical tabulation — still in use today — helped revolutionize the world we live in.



Courtesy IBM

Hollerith Tabulating Machine

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Calendar

Sept. 30-Oct. 2, Washington, D.C. — **Computer Performance Measurement and Capacity Planning.** Contact: Joe Menendez, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Sept. 30-Oct. 2, Piscataway, N.J. — **IMS/VS On-line Message Formatting.** Contact: I. Zelin, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

Sept. 30-Oct. 2, Washington, D.C. — **Electronic Mail.** Contact: National Institute for Management Research, Department M, NIMR Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

Sept. 30-Oct. 2, Wellesley, Mass. — **Financial Analysis Workshop for Data Processing Professionals.** Contact: Priscilla Goudreault, Q.E.D. Information Sciences, Inc., P.O. Box 181, Q.E.D. Plaza, Wellesley, Mass. 02181.

Oct. 1, Rochester, N.Y. — **The Advanced Secretarial Seminar.** Contact: Registrar, American Seminars Institute, 1985 Spruce Hills Drive, Bettendorf, Iowa 52722. Also being held Oct. 2 in Buffalo, N.Y.

Oct. 1-2, Washington, D.C. — **Advanced Records Management: Automated Document Control, Storage and Retrieval Systems.** Contact: Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

Oct. 1-2, Washington, D.C. — **Seminar IV: Local Networks and Office Automation.** Contact: Telestrategies, Inc., Suite 102, 6842 Elm St., McLean, Va. 22101.

Oct. 1-2, Palo Alto, Calif. — **Managing Software Projects.** Contact: DPMA Seminars, Department MSP, P.O. Box 91295, 5959 W. Century Blvd., Los Angeles, Calif. 90009. Also being held Oct. 19-20 in Anaheim, Calif.

Oct. 1-2, Boston — **Trainers and Simulators.** Contact: AIAA Conferences, Department T&S, P.O. Box 91295, 5959 W. Century Blvd., Los Angeles, Calif. 90009. Also being held Oct. 19-20 in Washington, D.C.

Oct. 1-2, Chicago — **SAS Procedure-Writing Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Oct. 1-3, Hilton Head Island, S.C. — **Practical Programming and System Analysis Management.** Contact: Belden Menkus, Program Chairman, P.O. Box 85, Middleville, N.J. 07855.

Oct. 2-3, Trenton, N.J. — **The Electronic Office: Concepts and Issues.** Contact: Barbara Rufrano, John Wiley & Sons, Inc., 605 Third Ave., New York, N.Y. 10158.

Oct. 4-7, Vancouver, B.C. — **Electronic Computing Health Oriented.** Contact: Steve Huesing, Director of Fiscal Services, Royal Columbian Hospital, 330 E. Columbia St., New Westminister, B.C.

Oct. 5, Milwaukee — **Stradis Management Overview of Structured Systems Development Methodology.** Contact: George Blatt, Department K277, Box 516, St. Louis, Mo. 63166. Also being held Oct. 7 in Houston, Oct. 9 in Los Angeles, Oct. 12 in Cleveland and Oct. 14 in Stamford, Conn.

Oct. 5, Los Angeles — **The Master Method of Selling Small Business Systems.** Contact: Seminars, M.W.L., Inc., 32038 Watergate Center, Westlake Village, Calif. 91361. Also being held Oct. 23 in Atlanta.

Oct. 5, Washington, D.C. — **DOS/VSE Concepts & 4300 Facilities.** Contact: Registrar, Cincom Systems, Inc., 2300 Montana Ave., Cincinnati, Ohio 45211.

Oct. 5-6, Washington, D.C. — **Software: Critical Decisions.** Contact: Software Conference, 12611 Davan Drive, Silver Springs, Md. 20904.

Oct. 5-6, Washington, D.C. — **Proposal Preparation and Contractor Selection.** Contact: TMSA Conferences, P.O. Box 91295, Department PP&CS, Los Angeles, Calif. 90009.

Oct. 5-6, San Francisco — **SAS Two-Day Basics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Oct. 5-6, Philadelphia — **Software: A Legal Briefing for EDP Professionals.** Contact: American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held Oct. 19-20 in Houston and Oct. 26-27 in San Francisco.

Oct. 5-6, Los Angeles — **Third Annual Future Shock — Computers in the 1980s.** Contact: DPMA Conferences, Department Comp 80, Suite 1016, P.O. Box 91295, 5959 W. Century Blvd., Los Angeles, Calif. 90045. Also being held Oct. 15-16 in Washington, D.C.

Oct. 5-7, Wellesley, Mass. — **On-line Systems Design.** Contact: Priscilla Goudreault, Q.E.D. Information Sciences, Inc., P.O. Box 181, Q.E.D. Plaza, Wellesley, Mass. 02181.

Oct. 5-7, Wellesley, Mass. — **Data Base Fundamentals.** Contact: Priscilla Goudreault, Q.E.D. Information Sciences, Inc., P.O. Box 181, Q.E.D. Plaza, Wellesley, Mass. 02181.

Oct. 5-7, Wellesley, Mass. — **Project Management and Control.** Contact: Priscilla Goudreault, Q.E.D. Information Sciences, Inc., P.O. Box 181, Q.E.D. Plaza, Wellesley, Mass. 02181.

Oct. 5-7, Chicago — **Financial Information Systems: The New Generation.** Contact: NIMR Seminars, Department K, P.O. Box 3727, Santa Monica, Calif. 90403. Also being held Oct. 26-28 in New York.

Oct. 5-7, New York — **Using the Microcomputer in the Public Accounting Practice.** Contact: Stephanie Gaubatz, RHY Consultants, Inc., 1444 Balsam St., St. Paul, Minn. 55122.

Oct. 5-7, Topeka, Kan. — **Data Structured Systems Design User's Conference.** Contact: Jim Highsmith, Ken Orr and Associates, Inc., 715 E. 8th, Topeka, Kan. 66607.

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United Kingdom:
West End Surrey 44-9905-6464

Calendar

Oct. 5-9, Saratoga Springs, N.Y. — **Recent Advances in Computer Graphics & CAD/CAM.** Contact: Center for Interactive Computer Graphics, JEC 2027, Rensselaer Polytechnic Institute, Troy, N.Y. 12181.

Oct. 5-9, Denver — **Structured Design & Programming Workshop.** Contact: BSI, 4720 Montgomery Lane, Bethesda, Md. 20814.

Oct. 5-9, Boston — **SNA, But Not All IBM.** Contact: Telecom Computer Technology International, 599 N. Mathilda Ave., Sunnyvale, Calif. 94086. Also being held Oct. 19-23 in Dallas.

Oct. 5-9, Washington, D.C. — **The Information Engineering Revolution.** Contact: Jill Hyman, Information Methods Corp., Suite 1451, 10 Milk St., Boston, Mass. 02108. Also being held Oct. 19-23 in Chicago.

Oct. 5-9, Wichita, Kan. — **Structured Analysis.** Contact: Boeing Computer Services Co., 453 S. Webb Road, Wichita, Kan. 67207.

Oct. 6-7, Washington, D.C. — **Word Processing Systems Expo.** Contact: National Trade Productions, Inc., Suite 206, 9418 Annapolis Road, Lanham, Md. 20706.

Oct. 6-8, Washington, D.C. — **Effective Writing Workshop.** Contact: Boeing Computer Services Co., 7980 Gallows Center, Vienna, Va. 22180.

Oct. 6-9, Minneapolis — **Hands-On Local Network Workshop.** Contact: Hands-On Workshop, Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.

Oct. 7-9, Williamsburg, Va. — **Effective Training Design: Beyond the Basic.** Contact: George Washington University, Division of Continuing Education and Summer Sessions, Professional Development/Tidewater Center, 2019 Cunningham Drive, Hampton, Va. 23666.

Oct. 7-9, Raleigh, N.C. — **Human Factors in Office Automation.** Contact: Priscilla Goudreault, Q.E.D. Information Sciences, Inc., P.O. Box 181, Q.E.D. Plaza, Wellesley, Mass. 02181.

Oct. 7-9, San Francisco — **Corporate Electronic Funds Transfer Conferences.** Contact: Sheila M. de Valia, EFT Association, Suite 800, 1029 Vermont Ave., N.W., Washington, D.C. 20005.

Oct. 7-9, San Francisco — **SAS CPE Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Oct. 8, Topeka, Kan. — **Systems Maintenance Update Conference.** Contact: Jim Highsmith, Ken Orr and Associates, Inc., 715 E. 8th, Topeka, Kan. 66607.

Oct. 9, Washington, D.C. — **Effective Listening Workshop.** Contact: Boeing Computer Services Co., 7980 Gallows Center, Vienna, Va. 22180.

Oct. 9-13, Cannes, France — **Vidcom 81- Telematics and Data Base.** Contact: Commissariat General: 179 Ave. Victor-Hugo, 75116 Paris, France.

Oct. 11-13, Dallas — **Trans-IV-Mation/Trans IV User Group.** Contact: Peggy Landon, Informatics, Inc., 21050 Vanowen St., Canoga Park, Calif. 91304.

Oct. 11-14, Dallas — **Inquiry IV/IMS User Group.** Contact: Peggy Landon, Informatics, Inc., 21050 Vanowen St., Canoga Park, Calif. 91304.

Oct. 12-13, Denver — **Users' Guide to Systems Development.** Contact: BSI, 4720 Montgomery Lane, Bethesda, Md. 20814.

Oct. 12-14, Boston — **X.25 and Other Packet Switching Protocols.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

Oct. 12-16, Chicago — **Design Techniques Workshop.** Contact: BSI, 4720 Montgomery Lane, Bethesda, Md. 20814. Also being held Oct. 19-23 in Short Hills, N.J.

Oct. 12-16, Washington, D.C. — **Microprocessors and Microcomputers: Theory and Applications.** Contact: Director, Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

Oct. 12-16, London, England — **Structured Analysis, Design and Testing of Computer Systems.** Contact: Director, Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

Oct. 12-16, London — **Introduction to Ada Computer Programming Language.** Contact: Director, Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

Oct. 12-16, London — **Microcomputers in Control Systems.** Contact: Director, Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

Oct. 12-16, London — **Computer Cryptography in Data Processing and Communications Systems.** Contact: Director, Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

Oct. 12-16, Dallas — **Structured Design and Structured Programming Workshop.** Contact: Dr. Ned Chapin, Infosci, Inc., Box 7117, Menlo Park, Calif. 94025.

Oct. 13-14, New York — **Computing and Communications in the 1980s.** Contact: MSRA, Inc., Department CC81, Suite 200, 115 Broadway, New York, N.Y. 10006.

Oct. 13-14, Worcester, Mass. — **Data Communications.** Contact: Worcester Polytechnic Institute, Continuing Professional Education, Worcester, Mass. 01609.

Oct. 13-15, New York — **Understanding and Using Computer Graphics.** Contact: Bob Sanzo, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

Oct. 13-15, New York — **Project Management and Control.** Contact: Priscilla Goudreault, Q.E.D. Information Sciences, Inc., P.O. Box 181, Q.E.D. Plaza, Wellesley, Mass. 02181.

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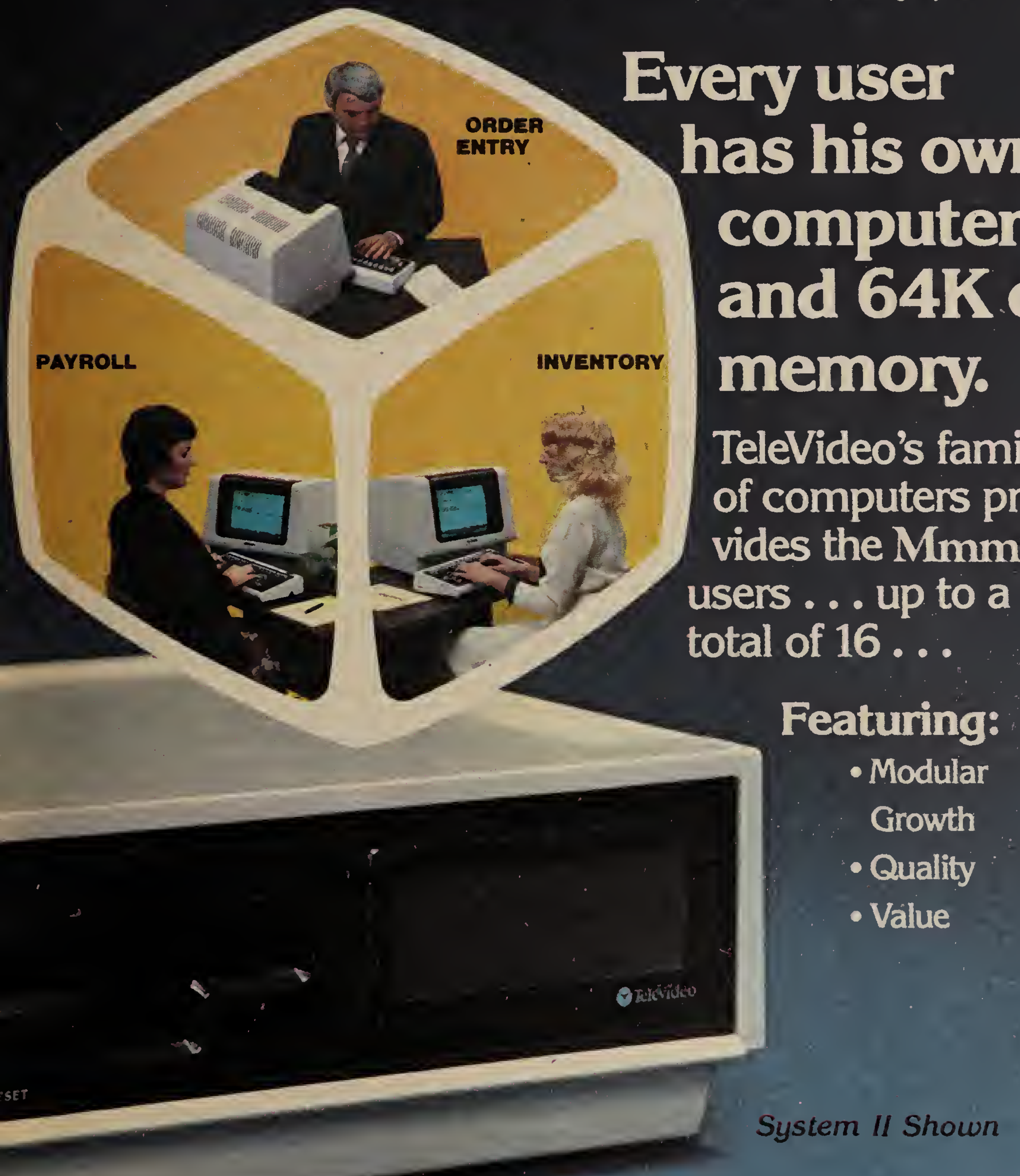

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EDITORIAL

The DP Mystique

The DP mystique, which once ensured some degree of autonomy for systems professionals, may be wafting away in many organizations.

Users have learned a few things about systems in recent years. They can now give many DP managers a tough argument at long-range planning conferences.

Until the past few years, DPers mystified other people in their organization with jargon and peculiar perspectives. But users are learning this jargon to some extent, and they can empathize with the systems perspective more than ever.

Enough people have migrated back and forth between user departments and DP departments for many organizations to have gained, rather unwittingly, comfortable dialogue between the two communities.

Moreover, methods for structuring communications between the user department, which wants a systems revision, and the DP department, which hoards knowledge of a system, forge a bridge across the chasm of mystique. A decade ago, this was not possible.

If all this checks the influence of DP executives over the rest of an organization, it also spreads around responsibility (occasionally, culpability) for systems matters. And DP executives seem to want that.

New Opportunities

Separation of information management from systems management may limit the DP department's clout, but it could create new career opportunities for DP professionals.

This separation, which would come from information resources management (IRM), could allow DP managers to step into roles as crucial to corporate success as those of chief financial officer or marketing vice-president.

IRM calls for much more than a computing background. Many DP managers are unqualified for the job of ensuring that information flows truly benefit their organization.

But some DP managers, who also possess insight into user wants and needs and the organization's overall course, may go farther with IRM than they could as technical specialists.

DATA PAST

Five Years Ago
Sept. 6, 1976

NEW YORK — The U.S. government and IBM agreed to a proposal by Judge David N. Edelstein that the parties and court alike hope will expedite the now 15-month-old antitrust trial "considerably."

The judge, who was hearing the case without a jury, suggested the government cease reading portions of the depositions of key IBM officials and of the corporation's internal documents into the record.

— — —

WASHINGTON, D.C. — The financially beleaguered U.S. Postal Service (USPS) saw its computerized work measurement system, tested on letter carriers in Indiana and Oregon, come to a halt as standard mail was resumed.

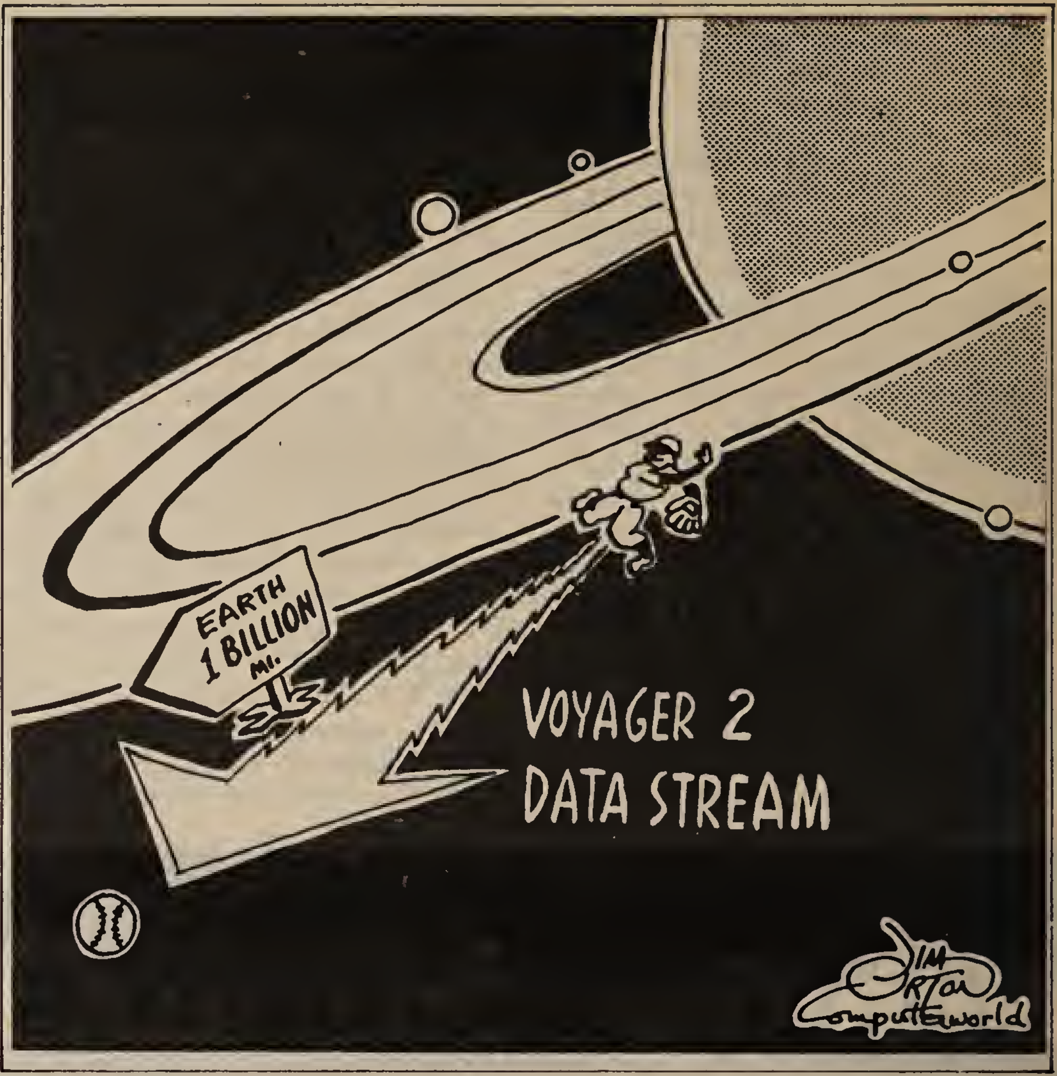
The final showdown between USPS and the National Association of Letter Carriers over the "Kokomo Plan" took place last month with a final decision handed down by an impartial labor dispute arbitrator, Sylvester Garrett.

Ten Years Ago
Sept. 1, 1971

WASHINGTON, D.C. — Despite continuing controversy and the temporary refusal of at least one state to participate, the FBI's computerized National Criminal History System will begin operation in November.

Records of everyone arrested for all but minor offenses will be centralized in the FBI's 360/65 here; data eventually will be available on-line to police departments and corrections officials throughout the country.

The system will start slowly, with only a few states participating and most of those only adding records of people arrested after November. No attempt will be made to computerize the FBI's 20 million manual files.



'Stee-ri-i-ke!'

LETTERS

Reference Checking

As good as *Computerworld's* advice is in "Check References — Or Else" [CW, Aug. 17], it is unlikely that information about senior DPers can be freely exchanged prior to employment in sensitive, ability and talent-related positions. After the fact, the information is difficult to obtain and its value problematic. Before hiring, few such individuals wish to have their current or recent employer made aware of their job search.

A sample tale (salary picked at random) may illustrate why conversing with a former employer of one's new employee can be meaningless. A childish, talented young person, unhappy, solicited a job with a substantial company by claiming to have been earning $37.5K (although only earning $30K) and was quickly hired at $42K.

After employing this person for several weeks, the new employer then solicited the old employer seeking confirmation of prior earnings and any relevant information the former employer might have relative to the employee. The ex-employer never answered the request, despite the obvious misstatement of earnings.

However, the "DP grapevine" usually succeeds where reference checking may fail. The grapevine provides personal and technical information relatively easily and usually threatens neither employers nor employee. The good-looking resume is a veil that can be readily penetrated by penetrating professionals.

One of the values derivable from DP resumes is the attitude expressed, voluntarily or involuntarily, in the format chosen and the activities or achievements highlighted. More can be learned from this form of paper perusal than from extensive conversation, in many cases, because the attitude is a plain statement of how an individual wishes to be viewed and therefore, how he or she would be employed.

C.A. Hirsch
Systems Programmer
Brooklyn, N.Y.

Warning to Buyers

Your recent article "Users Warned of 'Trusting' Contract Vendors" [CW, Aug. 17] brought to light a common and often misunderstood problem. When corporate executives or managers base a DP purchase decision largely on how they "feel" about the potential vendor, they are violating the rules of decision making that apply to every other purchase of a major corporate asset.

Ideally, after evaluating several different systems, the buyer should structure the contract or purchase agreement to incorporate the major review points during the implementation into the "progress payment" schedule. In this way, the risk (or amount of money at risk) is more proportional to the percentage of the system that is completed. If possible, no money should be paid (nor hardware delivered), until all of the software is modified, tested and installed.

Unfortunately, too many law firms or in-house counsels have little or no knowledge or experience in negotiating DP agreements. Accordingly, they often turn to outside experts who can assist in this phase.

This can be an effective alternative if the consultant firm used is expert, experienced and impartial — selling neither hardware nor software.

Steven D. Sass
Vice-President,
Management Systems
Advanced Resource
Development Corp.
Columbia, Md.

SOFTLINE/ Werner L. Frank

Economic Trade-Offs in Software

The goal of satisfying the data processing user is sometimes confused with the popular notion that the customer is always right. But an open-door or overly responsive policy with regard to computer users can be the perfect invitation to disaster in building software.

Certainly, we do not advocate placing restrictions on the user in specifying functional requirements for application software. However, throughout the definition stage of the software implementation process, the DP professional can make important contributions by always keeping in balance the cost/benefit equation, which relates scope of solution to practicality of implementation.

The classical 80/20 trade-off is as operative in software implementation as it is in many other situations. Frequently, it is the last 20% of what users want that may well take 80% of the effort or create 80% of the ultimate difficulties.

To be more specific, the user's needs and wants should be heard, but in return, the cost and risk should also be made clear. To keep everything in balance, the user just may not obtain all that he wants.

The cost of software depends upon how it is acquired and how costs are calculated. Software expenditures include the following cost components:

1. Requirements study.
2. Feasibility analysis.
3. Functional design.
4. System specification.
5. Specifying and providing hardware.
6. Programming.
7. Testing.
8. Acceptance.
9. Documentation.
10. Training.
11. Conversion.
12. Operation.
13. Maintenance.

Not only is each of these activities a people-intensive process and, therefore, expensive, but the steps also take substantial time to complete.

There are additional costs typically not identified at the outset of a software project, such as:

- Time and opportunity loss by not having the solution immediately.
- Poor estimates leading to project overruns.
- Incompatibility of the users' real requirements with what is actually delivered.
- Change of the initial environment and requirements by the time the project is completed.
- Ultimate and ongoing maintenance problems.

The internal manpower costs and displaced profits of an organization must also be considered when the best "people resources" are allocated to conceiving, defining and architecturally designing the external characteristics of a given computer application solution.

User satisfaction and the price ultimately paid for a piece of software are a function of that software's timely availability as well as its performance against stated objectives.

At the outset, the user is really in a dilemma. He stands before the proverbial candy counter, not knowing which, nor how many, pieces to select.

At this point the following issues must be confronted:

- Is the requirement truly unique to the user?
- Does the user really need report formats customized to certain unique specifications?
- Is every requested functional feature of equal priority or value?
- Is time of the essence?

Some users do not know how to address these issues. Given a choice, they may well opt for anything that is available and ask for a custom solution, too. But that's just the point. For new users, as well as veterans in developing applications, the key issue is in differentiating between choices with all the economic alternatives clearly presented.

Despite the present trend of giving the user exactly what he wants, DP professionals should proceed as follows:

1. Provide the user with a candidate solution to be used as a checkpoint or benchmark rather than present an open invitation to include everything and anything the user ever wanted.
2. Lead the user to existing solution (for example, packaged software). These may be general-purpose and not necessarily an exact fit of the way the user is currently conducting his business or wants to conduct his business.
3. Wherever applicable, provide the user with a make-or-buy tradeoff exercise.

With respect to the last point, the presentations of Figures 1 and 2 may help in analyzing the issues. Clearly a cost analysis such as suggested in Figure 1 is paramount in reaching an early decision point. Following this,

(Continued on Page 44)

	MAKE	OR	BUY
ESTIMATED DEVELOPMENT COST	$250,000		$35,000
EVALUATION COST	N/A		15,000
DEVELOPMENT TIME	15 MONTHS		3 MONTHS
CONVERSION COST	$50,000		$50,000
CONVERSION TIME	3 MONTHS		3 MONTHS
EXPECTED ANNUAL SAVINGS	$100,000		$100,000
PAYBACK STARTS	18 MONTHS		6 MONTHS
INVESTMENT RECAPTURED	54 MONTHS		18 MONTHS

Figure 1. The Make or Buy Economics

HUMAN CONNECTION/Jack Stone

Gustatory Glitches

Item from the *Washington Post*, entitled "Computer-to-Computer Grocery Ordering From Stores on Its Way": "Sometime next month, a computer at Giant Food Headquarters in Landover, Md., will phone a computer at Nabisco Co.'s offices in New Jersey and order a truckload of Shredded Wheat.

"The Nabisco computer will authorize the shipment, notify Giant's computer when it's coming and electronically transmit the bill.

"When the cereal arrives, Giant's computer will crank out a check — the first piece of paper in a computer-to-computer ordering system that will be tested this fall by the food industry."

The article caught my attention partly because of my last programming management assignment.

My friend, Timothy Wade, an expert DP analyst and gourmet extraordinare, was profoundly affected by the announcement and telephoned me immediately after the article appeared.

"Stone, here we have another example of how the computer industry, although reducing paperwork and speeding information processing through its magnificent machines, has restricted its sights to matters internal to the business. Aside from some hoped-for price reductions, few gains will be observable to the end user — the store customer. So one is forced to answer the question, how will a computer system improve the quality of grocery life, or, in other words, the sensation of succulence upon one's palette?"

"Tim, it seems you have your finger on a bread and butter issue. What do you think should be next on the systems development menu?"

"To illustrate my thesis, let's study an example in the case of the New-York-style delicatessen nearly everybody believes, quite erroneously, that bagels must be hard enough to break a bicuspid before they can be fully appreciated."

"Truly so, and my battered wisdoms are my testimony."

"Let me bring you to the edge of enlightenment, dear friend. Do you know that after bagels are output from the baking process, they are soft? Even tasty?"

"Soft, you say? And tasty?"

"Precisely. So what's needed is an augmentation capability installed at the side of the Universal Product Code scanner, which in effect performs the functional equivalency of a sensor-based, computer-controlled-bagel-softness-evaluator at counter check-out time. Thus, the aficionados will receive on-line readouts of the bagel softness coefficient and over the years will be able to develop universal standards of this critical parameter, thereby attracting millions of new end users of this gustatory delight."

"Tim, I'm beginning to savor your drift. Feed me more."

"The issue I've been discussing focused on the single-thread systems challenge. Suppose now we consider a multithreaded situation — namely, systems integration — in this case, the bagel sandwich. The design considerations for this system are based on a very complex tree-structure of rules handed down through the centuries from father to son and cast in concrete. They are far too complicated to present in detail, but here are some sample constructs: corned beef — very, very lean — should be programmed only for onion or sesame seed bagels. If conditions are set for a pumpernickel orientation, then go to pastrami. Lox is logically consistent with plain bagels, but only if logically disconnected from cream cheese (served on the side). And just how the cucumber pickle is integrated into the program is a flowcharting nightmare."

"Maybe I should just stick to grilled cheese and tomato."

"Clearly, we see the requirement for the on-line terminal at the counter that can accept a customer's desired choices for sandwich ingredients, develop a list of 30 or 40 top choices of sandwich — based on tradition, of course — and offer them to the customer on the screen, with a synthesized graphic showing approximately how the sandwich might appear. If the image is presented in eight different colors, you've got an investor."

READER COMMENTARY/Howard A. Karten

'As the Disk Turns' to Create Suds on TV

One of those infamous "security breaches" allowed me to obtain the upcoming fall TV schedule, which is reproduced here.

As *the Disk Turns* (NBC, 1 p.m. Monday through Friday). The adventures of the Winchester family as they cope with the problems of technological change. Spin-off of last year's popular soap *The NRZI Family*. Series deals with the usual stuff of data operas — cases of mistaken data set identity, mismatches between disk drives and media and so on.

Frontier DP Manager (CBS, 9 p.m. Mondays). Martin Mull stars in the second year of this inertia-packed series about the problems of a DP manager in a remote frontier town as he struggles to keep his data base current and to satisfy the sometimes arbitrary system requirements of management in far-off Headquarters City.

PCM Salesman (ABC, 9 p.m., Monday). Don Rickles wages a lonely battle as he attempts to win over customers from PCM mainframes and convince prospects that the PCM business is a durable one with a future. (Note: At press time, it was learned that the series is in danger of being canceled.)

Little Electronic Cottage on the Prairie (NBC, 7 p.m., Monday). Alvin Toffler hosts this heartwarming story of the Goodies, a family of DP pioneers who work in their homes using terminals. Planned episodes focus on the very human problems the family faces as it attempts to cope with rising telecommunications costs, the long distance from the nearest thermal paper store and intrafamily tensions caused by everyone working in the same house. A running theme of this popular show will be the family's attempt to cope with the range wars being fought between the satelliters and the fiber opticians.

The Rewrite Of the Communications Act (PBS, live coverage throughout the year). Watch the foibles of the House Commerce Committee as it attempts once again to rewrite the 1934 Communications Act. During lulls in the committee action, live minicam reports will take viewers to cloakrooms, smoke-filled hospitality suites and other places as deals are struck and anticonsumer compromises are negotiated.

Laurabelle and Elayne (NBC, 9 p.m. Tuesday). The madcap adventures of two assembly-line workers in Silicon Valley as they attempt to work their way up and off the assembly line. The first show of the season, in which the girls unknowingly insert the correct chips into the wrong sockets, sets the pace for future episodes.

The Managers (PBS, 9:30 p.m., Tuesday). A different profile each week of a DP manager who struggled to overcome the twin handicaps of excess technical knowledge and arcane company politics.

Sandy Valley (ABC, 9 p.m., Wednesday). Continuing prime time soap opera of goings-on in Sandy Valley, a lovely semirural setting of outward calm but intense inner turmoil.

A new aspect of the show this year will be the bitter political infighting between Bigbucks Partners Ltd. and Charga, Stiffee & Howe, two venture capitalists. Although the show is now entering its 10th smash year, it shows no signs of tiring.

Westborough (ABC, 10 p.m., Wednesday). Spinoff of Sandy Valley now in its second year. Similar rough-and-tumble action as in Sandy Valley, but on a somewhat more dignified level.

Proxmire! (GBS, 9 p.m., Thursday). Government auditor David Starkman each week wages a lonely battle to expose fraud, mismanagement and waste in government DP installations. Special guest appearances from time to time by Grace Hopper, A. Ernest Fitzgerald and others.

Night Magazine GBS, (7:30 p.m., nightly). Mini features of general interest. Highlight: Each week, Consultant Toil tells viewers how to write another quick and useful 25-line subroutine.

Fantasy Department (CBS, 8 p.m. or so, Friday). Each week, disenchanted DPers visit Fantasy Department, a magical DP shop in Southern California, where they live out such fantasies as having finalized program specifications, enough time to develop systems without overtime and promotions to Super Technical Guru. Each visitor comes away from the experience having learned a pithy lesson based on currently-popular humorous posters.

*M*I*S*S*H*O*P* (1101:11110 p.m., MVS). Tony Albert-Jones and Tom Field as consultants obligated to serve out their contracts in a large DP shop permeated by management ineptitude. Half-hour comedy follows the pair as they deal with typical difficulties such as not having enough computer time, never having enough time to do a job right, but always having enough time to do it over, data checks, continuing shortages of qualified personnel and so on. Holdover show now in its 20th smash year.

Freelance writer Karten notes, "I'm waiting for the fall listings for Viewdata."

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LETTERS

Army Salutes CW

As a new subscriber to your newsweekly, I would like to commend *Computerworld* for being a quality and information-filled publication. Since I am a Regular Army officer, I must often serve in positions that do not involve computers even though I hold a computer science degree from West Point. In order to remain somewhat informed about events in the industry, I recently began subscribing to CW. I find the quality of articles excellent and especially like your detailed "In Depth" features and editorials.

Although some writers complain about the number of advertisements, even the advertising proves useful by showing the new products and areas of intense competition. While a publication cannot compete with practical experience, your newspaper will at least make my transition back to the computing environment less painful. Keep up the good work!

Michael J. Molohon
2LT, Signal Corps
Department of the Army
Ft. Hood, Texas

'Let Them Buy Software'

Because of some soft spots in "Beware of Advice from Experts About Software" [CW, Aug. 24], reincarnation seems tantalizingly possible as Werner L. Frank paraphrases Marie Antoinette's fateful words, "let him buy customized software." This appears to be a vendor's prejudice for selling generalized software as if it substitutes well for customized. In her time, buying cake was viewed as expensive, as custom software might be viewed today, but both the article's author and doomed Marie failed to understand the environment with which the public lives. Fateful words, because they put the lie to almost every claim that packaged software is responsive to user needs and their related ability to pay.

Naturally, custom software is usually more expensive in the short run than packaged because it is responsive to user needs unless the user plays, or is played for, the fool. It behooves the package vendor to establish the attractiveness of the proffered cost/benefit analysis of package vs. custom software. Because there are no limits to the number of vendors, the talent available or the possibilities for improvement, the sanguine path of making the vendor perform or finding a vendor willing to perform may be successfully pursued.

Wilford Ling Woodside III
Programmer
Bronxville, N.Y.

Broaden DP Education

Regarding your article "Academia Fails Test for DP Jobs" [CW, Aug. 17], I must take exception to the opinions expressed by the survey. Universities should not be in the business of training programmers. Those of us in DP must have a broader perspective on where our industry is headed as opposed to where we have been.

We have been guilty of acting and thinking like technicians and ignoring our real customer: the end user. We respond to his problems with a new set of computer programs designed by technicians that may meet half the user's needs.

Computerworld is filled with articles about how we must become business-oriented and become team players. We can only hope to accomplish this with problem solvers (systems analysts) trained in general business as well as DP concepts. These individuals should be charged with solving the end user's real problem, whether or not the computer is involved.

The art of programming is not an art at all, but a science. Coding programs is a mundane occupation that will eventually be eliminated. Why do we need to pay college-trained individuals to do the work that high school graduates can easily handle?

The need for so many computer science majors is questionable. Do we need that many compiler and software experts? What we need are more business majors who can communicate effectively and can analyze a problem rationally and realistically.

Let the trade schools train the coders.

Thomas J. Francl
Director
Information Services Division
The Bekins Co.
Glendale, Calif.

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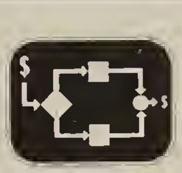
**Washington, D.C.
October 26–28, 1981**

**San Francisco
November 30–December 2**



Barry Boehm on
Software Engineering Economics

If the software economics maze has got you down, let Barry Boehm put things into perspective. Software engineering economics requires project planning and control techniques. Dr. Boehm will detail the latest formulas and methods to keep your software costs in check; the presentations will be keyed to his forthcoming text on the subject. This seminar will include an in-depth examination of the COnstructive COst MOdel (COCOMO), a powerful new model with a consistent hierarchy for software cost estimation. Other analysis and techniques for improving software productivity will also be discussed.

San Francisco — December 7-9, 1981

Markov and Piatkowski on
SNA

SNA is the strategic direction for a large segment of the computer industry. It is an ever-evolving communications architecture which addresses bit transportation functions and the dialogue disciplines that enable a meaningful communication among diverse units. James Markov and Thomas Piatkowski, two of the key architects of SNA, provide an understanding of its concepts, rationales, formats, and protocols of SNA. This creates a logical foundation for distributed data processing systems and a communication architecture that is easily applied.

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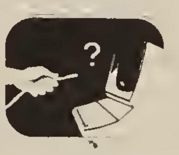
Sunnyvale — November 9-11, 1981



Shoch, Roberts and Weir on
Local Data Networks

Networks are about to invade your office! You are faced with many options and opportunities. Are you aware of which network architectures will best meet your current and future needs? John Shoch, Larry Roberts and Don Weir will provide the answers you need through close examination of Ethernet and other architectures. Bring yourself up-to-date in the fast-moving technology of local data networks and learn the likely impact and directions for today's corporate data communication needs.

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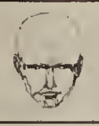

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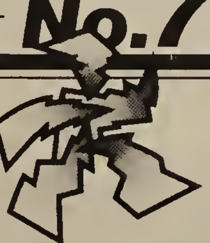

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Economic Trade-Offs in Software

(Continued from Page 41)

the risk vs. leverage argument can be pursued to understand what is realized under the "make" option and what is achievable through the "buy."

Bargain Prices

If a piece of software is available on the commercial marketplace and if it fits one's requirements, or even *nearly* fits, then current marketplace software prices are a bargain the user can't ignore.

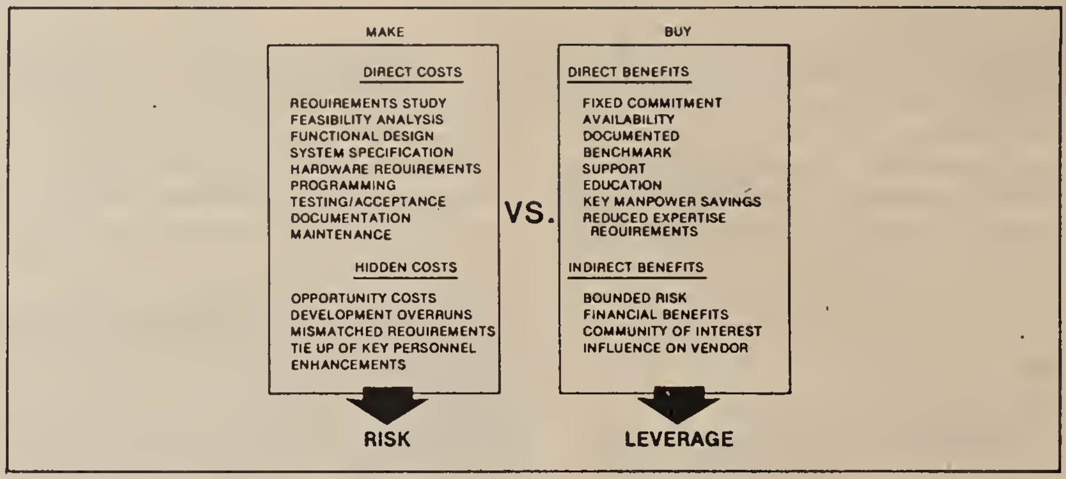

Figure 2. Software Acquisition

In contemplating procurement of any software program, the economics almost always favors the low-risk, high-leverage solution of purchasing existing products. In make-or-buy trade-offs, paybacks from a purchase usually occur in one-third the time, while investment costs are also recaptured in one-third the time. The development time is reduced to one-fifth and development costs to as little as one-seventh.

To the extent that users can make modest accommodations to standardized software and accept whatever that standardized software does, they will benefit economically. On the other hand, if the user continues to demand the kind of customization from software that he often does, then the price of software will be driven up accordingly.

Standardized software is produced commercially for a large population and by definition has to be the sum total of requirements for that population. The chance of that software meeting across-the-board functional requirements of so many users, ipso facto, says that it is highly likely to satisfy most users. And, if that's the case, then a user ought to accommodate himself on the assumption that he wants to make an economic breakthrough.

Shortcut in Implementation

Not only is the purchaser of commercially available proprietary software able to buy the operating code, but he also gets documentation, training and continual maintenance. He is able, therefore, to shortcut many of the tasks already identified above and avoid the accompanying pitfalls in implementing software.

Even if the software product is not the ultimate solution, its lower cost makes it usable as a benchmark or test cell for identifying more specific and more customized needs.

The interaction of the in-house user and DP staff, conducting their interactive process of analysis (the first three components of cost) over many months, would more often than not equal the purchase price of the off-the-shelf software from outside sources.

Documentation

In fact, the price of available software can often be justified solely on the basis of the associated documentation. This documentation can be the starting point, or straw man, for a subsequent internal development if it is deemed that the off-the-shelf software code in itself is not applicable or is insufficient. In other words, one can purchase the package, use the documentation and throw away the code — that's how inexpensive many packages really are.

But there is an even more valuable, although frequently overlooked, tangible benefit. By associating oneself in the marketplace with other users of the same software product, one becomes a participant in a community of interest. If there are a substantial number of users, this situation will lead to a continually improved and responsive software product.

Application software maintenance has become a sizable — 60% — portion of the programming staff duties.

Finally, of course, purchased software can mitigate, if not avoid, the downside risks already identified as hidden additional costs of custom implementation, where time for completion and the end performance remain unknown for too long.

And to the financially concerned, purchased software can be treated as a capital investment to help the income statement, or it can often be leased if it is a question of cash flow.

Frank is executive vice-president of Informatics, Inc. in Woodland Hills, Calif.

The reports concerning the demise of the System/3 have been greatly exaggerated.

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Ada Compiler Built for Commercial Sites

By Rita Shoor
CW Staff

SAN DIEGO — Telesoft, Inc. last week introduced what it said is the first portable Ada compiler for the commercial market.

The announcement may surprise industry experts because production-quality compilers for Ada, the Department of Defense-sponsored language, were not expected to be commercially available until 1983.

The Telesoft-ADA compiler performs full Ada syntax checking and can produce code for "all but the most complex features [generic packages, for example] of the new language," according to Telesoft President Peter Dine. It supports packages, tasks, exceptions, identifier overloading and separate compilation "with limitations."

Emphasizing the portability aspect, a spokesman explained that the Ada compiler produces an intermediate code that can be translated or interpreted to execute on new processors "with a minimum amount of adaptation." The company is committed to continued development of the compiler over the next year and expects to make further releases as Ada's full specification is revised by the Department of Defense as part of the American National Standards Institute's standardization of Ada, he said.

Key Objective

Maintaining that one of the key objectives of Ada's design was to establish the basis for a new software components industry, Telesoft's primary target for this product will be distributors, Dine continued. Telesoft perceives these "distributors" as both vertical system integrators and internal systems designers for large corporations.

However, Dine could also "foresee in the future" situations where programmers might use Ada to solve certain application-oriented problems.

Introduced as a key component of Telesoft's programming support environment, the compiler will operate on any processor based on an MC68000 MPU board. The firm's native code translator produces code that can either be relocated by the operating system at run-time or, in conjunction with Telesoft's link-editor, can produce "ROMable" — read-only memory — code.

The next implementation of the software will be for Intel Corp.'s IAPX86 16-bit chip. Telesoft hopes to have versions for Digital Equipment Corp. VAX-11 and IBM 370 machines by the end of 1981.

Available immediately, the Ada compiler is priced at $2,400, the vendor said. The 68000 native code translator costs an additional $400. Telesoft is located at 10639 Roselle St., San Diego, Calif. 92121.

'Easytrieve' Gains Editing

OAK BROOK, Ill. — Pansophic Systems, Inc. announced here the addition of Interactive Editing Facility (IEF) for Easytrieve. The facility, which operates with all IBM 370, 30 series and 4300 operating systems, requires Version 1.1.1 or above of CICS.

IEF gives CICS users the on-line syntax checking capability of Easytrieve statements and/or programs, Pansophic said. IEF checks the syntax of Easytrieve statements via Pansophic's Panvalet/On-Line.

IEF reportedly provides three modes for checking syntax when creating Easytrieve programs on-line. These include an optional check of all or a portion of Easytrieve statements entered or displayed during program edit, automatic check of Easytrieve statements entered or displayed during program edit and automatic check of Easytrieve programs of specific format type during edit.

When any of these methods is used, error detection is provided by displaying the statement with the error in high intensity moving the cursor as near

(Continued on Page 48)

Culc Offers 12 Tools for Unix

NEW YORK — Commercial Union Leasing Corp. (Culc) has introduced 12 software products for the Unix user community. At the top of the long product list is an extended version of Culc's Fortran IV Plus compiler for commercial users. The original compiler was released to the Unix market about six years ago, according to Sandy Atwell, sales representative.

All of the software packages operate under Unix on Digital Equipment Corp.'s PDP-11 hardware. Available immediately are:

- Extended F4P — extended Fortran IV Plus compiler for commercial users; $7,500.
- Extended F4PGU — extended Fortran IV Plus compiler for government or university users; $3,750.
- Extended F4P Update — update for the 1979 Fortran IV Plus compiler for commercial users; $1,250.
- Extended F4PGU Update — update for the 1979 Fortran IV Plus compiler for government or university users; $700.
- Whowhere — program designed to help determine manpower and organize appointment schedules by keeping track of personnel on a daily basis; $1,000.
- Map — program that allows the user to manipulate data columns in a file. Suggested use is sort key alignment; $1,000.
- Appt — program generating an "on-line appointment book." It lists day, month, date, time and descriptive text; $500.
- Xtype — program designed to take advantage of bidirectional printing feature on Diablo printers. It allows the terminal to print forward and backward and reportedly results in 20% to 40% time savings; $1,000.
- Fdean — Fortran IV Plus debugger; $1,000.
- Cdean — Symbolic "C" language debugger; $1,000.
- Pdean — package to debug both Fortran IV Plus and "C" programs; $1,750.
- V6 to V7 Update — package to aid conversion from Version 6 to Version 7 of the Fortran IV Plus compiler; $100.

Culc is located at 115 E. 57 St., New York, N.Y. 10022.

'CA-Vterm' Gives VM/CMS Extended Terminal Support

JERICHO, N.Y. — A systems software product designed to enable the IBM VM/CMS user to have up to nine virtual terminals active from one physical terminal was announced here by Computer Associates International, Inc.

CA-Vterm is said to enable a VM/CMS user to toggle or switch from one virtual terminal to another by using a program function key. This reportedly eliminates the need to either disconnect one ID to log onto another ID or, as in most cases, to use an extra terminal.

The vendor claimed CA-Vterm reduces the number of physical terminals required. CA-Vterm can be used with IBM VM/SP or VM/370 operating systems and is available on a three-year lease at $2,500.

A variety of other lease plans are available, the vendor noted from 125 Jericho Tnpk., Jericho, N.Y. 11753.

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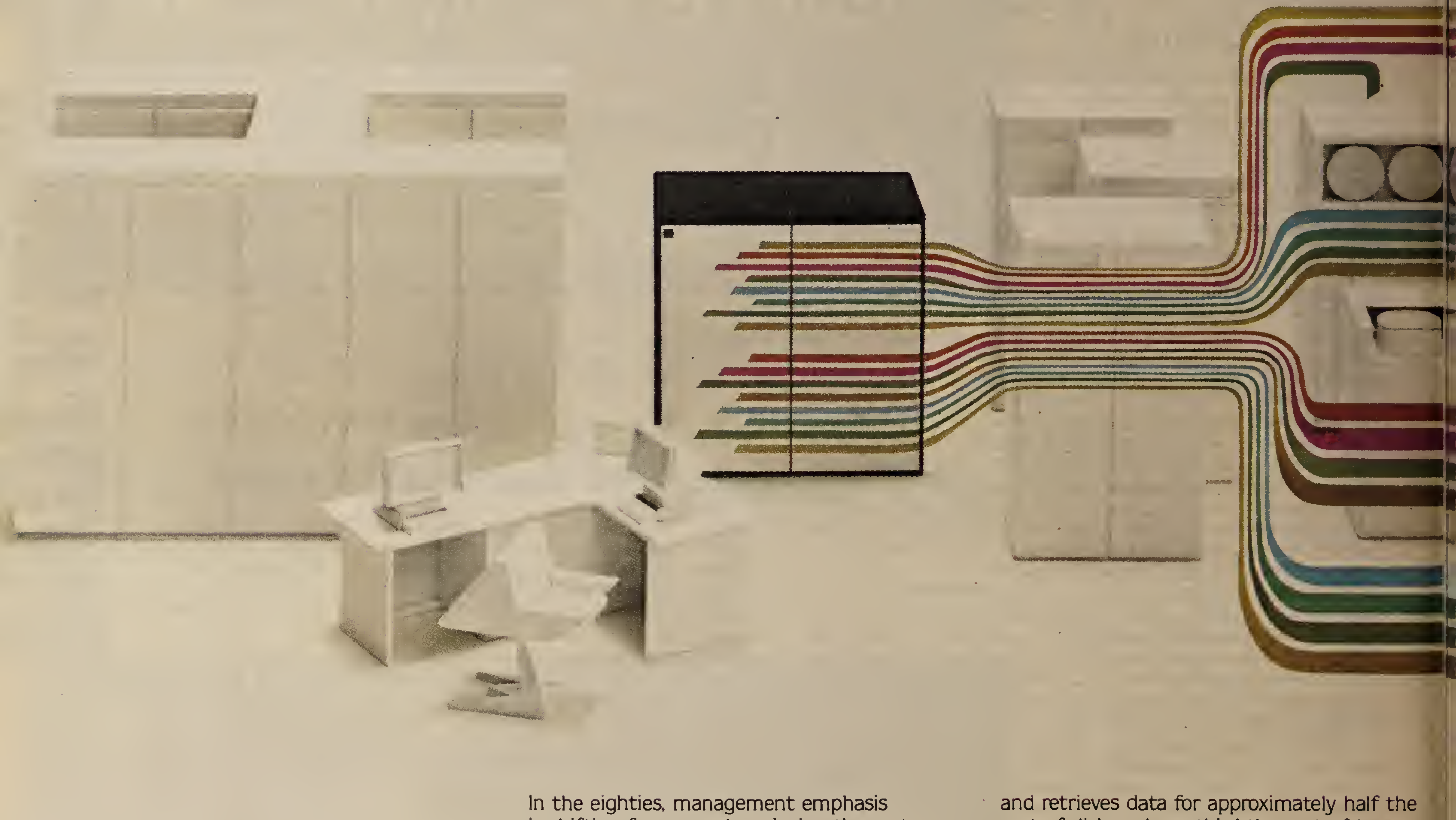

In the eighties, management emphasis is shifting from merely reducing the cost of computers to minimizing the cost of computing. That means boosting programmer productivity, eliminating mundane resource management chores, and improving hardware utilization.

Storage Technology's Virtual Storage System (VSS) is a powerful tool to accomplish these objectives. VSS nearly doubles DASD capacity, and in many applications, VSS stores and retrieves data for approximately half the cost of disk and one-third the cost of tape.

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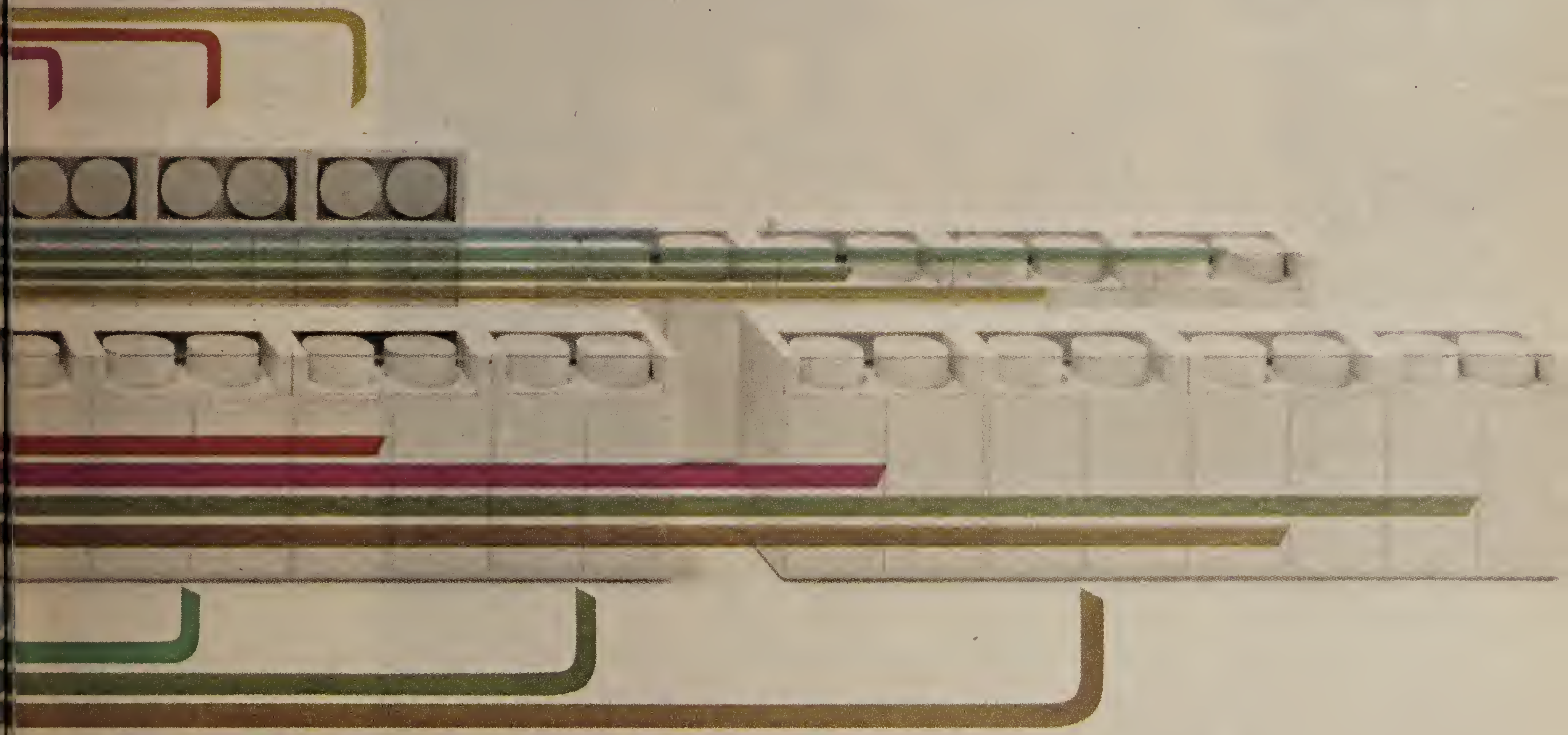

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What's the Buzz? *DBMS*

DBMS. That's one of the hottest buzzwords today — but do you really understand it? Are you clear, for example, about the meaning of such terms as "relational" and "hierarchical" and how they relate to your own installation?

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Tell us what it took to bring your batch data base on-line. Describe the impact the DBMS has had on the flow of information within your company. Pose the questions and the insights you have about DBMS.

Pictures, charts and/or graphs are welcome. Send stories (no more than six double-spaced, typewritten pages) by Oct. 2 to Rita Shoor, Senior Editor/Software, *Computerworld,* P.O. Box 880, Framingham, Mass. 01701.

'Abend-Aid' Tailored To DOS/VS, VSE

SOUTHFIELD, Mich. — Compuware has released an IBM DOS/VS and DOS/VSE version of its Abend-Aid debugging tool.

Abend-Aid includes more than 70 program modules that reportedly transfer the process of analyzing abends from the programmer to the computer.

The vendor claims an 85% rate for the package in solving program cancellations. When a cancel is solved by Abend-Aid, the full memory dump is eliminated, Compuware said. If not solved, the full dump reportedly is produced.

Once installed, Abend-Aid is said to be effective for old and new programs running in either a test or production environment.

The DOS/VS and DOS/VSE versions of Abend-Aid lease for $1,400 annually. A 30-day free evaluation is provided for interested users, Compuware said from 29433 Southfield Road, Southfield, Mich. 48076.

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MARTIN MARIETTA DATA SYSTEMS

Pascal Out For DG Users

COLUMBIA, Md. — A Pascal compiler for Data General Corp. computers designed to conform to the proposed Ansi standard has been announced by Rhintek, Inc.

The compiler features 117 error messages and a speed of compilation of more than 400 line/min, the vendor said.

The executable code is automatically linked to the Pascal support library by the final pass of the compiler, creating an executable file directly, while the compiler can compile 4,000-line programs in less than 32K words of memory, according to the company.

The Pascal compiler is priced from $2,000 to $4,000 plus the source code from Rhintek, Inc., P.O. Box 220, Columbia, Md. 21045.

'IEF' Fits 'Easytrieve'

(Continued from Page 45)

the error as possible and displaying an error message in the screen message area, the vendor explained.

IEF is priced at $9,000 for DOS and $12,000 for OS, and includes Panvalet/On-Line, Pansophic said from 709 Enterprise Drive, Oak Brook, Ill. 60521.

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Previously Unavailable to DOS

Measurement Facilities Update ADR's 'DOS/Look'

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) is offering an enhanced version of DOS/Look that reportedly includes measurement facilities previously unavailable to DOS users.

ADR claimed it has taken advantage of changes made to IBM's DOS/VSE Release 2 to extend DOS/Look into new areas of system performance management.

The new features reportedly include a long-term measurement facility (EPA), available for the first time to DOS/VS and VSE Releases 1 and 2; and Supervisor Call (SVC) analysis, which is said to provide detailed analyses of SVC and SVC-related activity.

EPA comes complete with summaries, plots and histograms that reportedly will help DOS managers tune the system, distribute resources, plan for future capacity and assess the impact of proposed system changes, the vendor said.

The SVS analysis function performs four distinct analyses: General SVC Analysis displays statistics on the number of SVCs issued, Execution Control Program (EXCP) Analysis displays EXCP counts, System Input/Output (SYSIO) Analysis displays the number of SYSIO SVCs issued and Load/Fetch Analysis displays Load/Fetch counts, the vendor said.

An enhanced Control Block (CB) command and a new Assignment (ASG) command also are part of the package for DOS/VSE Release 2 sites, the vendor said. CB reportedly provides access to any major DOS control block or portion of memory; ASG is said to report on device assignments, including logical devices that are unassigned or down.

Release 2.0 of DOS/Look will be available in the fourth quarter. The permanent license price for DOS/Look is $5,500. Monthly, three- and five-year leases also are available, the vendor said from Rt. 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

'HAS' Controls, Manages DP Hardware

COLUMBIA, S.C. — Policy Management Systems introduced the Hardware Accounting System (HAS), a CICS-oriented package that reportedly integrates into a single computer system the functional capabilities required to manage and control DP equipment.

HAS runs in an IBM OS/VS1 or VS2 environment and automates functions not readily available in manual systems or other in-house systems such as billing verification, accruals/depreciation tracking, alternate procurement analysis and planning for budgeting and resources, the vendor said.

Other capabilities of the software include inventory control and configuration analysis.

With on-line inquiry and real-time update, HAS is said to handle purchased, rental and leased equipment. The system reportedly accommodates up to 50 optional features per machine, separate sales and service vendors, software as well as hardware, both active and inactive equipment and equipment locations, the vendor said.

System inquiry features include access by partial keys; forward, backward and advanced paging; and automatic transaction/screen switching.

HAS is available for $20,000 from Policy Management Systems, P.O. Box One, Columbia, S.C. 29202.

Access Control Extended To DOS/VSE

DALLAS — Electronic Data Systems Corp.'s Security Access Controller (SAC) has been extended to support DOS/VSE operating systems.

SAC-DOS/VSE is said to provide system entry protection, data set protection, on-line controls, auditability and accountability. SAC supports MVS, MVT and VSI as well as DOS/VSE users.

The software is available through the firm's Software Products Division for a one-time license fee of $15,000 per CPU. Discounts are available to sites with multiple CPUs, the firm noted from 7171 Forest Lane, Dallas, Texas 75230.

IMSL Library Now Fits Cray-1

HOUSTON — IMSL, Inc. is offerings its mathematical and statistical Library, which includes a set of 495 Fortran subroutines, to users of the Cray-1 computer manufactured by Cray Research, Inc.

The subroutines are arranged in 17 chapters, covering such topics as analysis of variance, linear programming and nonparametric statistics, the vendor said.

An IMSL Library subscription includes the source code on magnetic tape, a three-volume Reference Manual, maintenance of the routine, the newsletter and consultations for $2,500 plus a $500 one time only charge. IMSL is located at NBC Building, Sixth Floor, 7500 Bellaire Blvd., Houston, Texas 77036.

Mailing List Updated

PRUDENVILLE, Mich. — A membership maintenance and mailing package for associations and organizations has been announced by Systems Consulting & Programming.

SCP-Sams features automatic generation of pressure-sensitive labels for membership renewal notifications, membership roster reports and analysis reports, the vendor said.

SCP-Sams is priced at $1,000 from Systems Consulting & Programming, 128 Driftwood Center, Prudenville, Mich. 48651.

DATA BASE SEMINARS

Performance Development Corporation has announced its fall data base seminar series. The following seminars are being offered:

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DBMS EVALUATION AND SELECTION
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'Pascal-2' Fits Existing Libraries, Operates on All PDP-11 Systems

PORTLAND, Ore. — Oregon Software, Inc. has introduced a Pascal compiler that operates under all Digital Equipment Corp. PDP-11 operating systems.

Written entirely in Pascal, the Pascal-2 compiler produces object modules that are compatible with existing libraries, according to an Oregon Software spokesman. The compiler produces object modules compatible with existing libraries and Pascal-2 programs can call modules written in Fortran, Assembly and other languages utilizing DEC's standard calling sequence, according to the spokesman.

Included with the compiler is a symbolic debugger that provides the programmer with interactive control of program execution at a high level, he continued.

The debugger generates a complete map of control points and data structures and identifies variables, values, procedures and breakpoints with programmer-specified names, the spokesman said.

Other features include an execution profiler, automated source formatting, cross-reference indexing and document preparation, he explained.

Pointing out that Pascal "suffers from the proliferation of dialects which are, for the most part, misguided and unnecessary," the firm included language extensions while avoiding modification of the base language.

The extensions are limited to areas such as separate compilation, direct access files and process control where facilities are not offered by standard Pascal, the representative noted.

Available immediately, a binary license for one operating system costs $3,450 for one CPU. Source licenses are also being offered by Oregon Software at 2340 S.W. Canyon Road, Portland, Ore. 97201.

Grids Package Helps Settle Health Claims

NEW YORK — An integrated, on-line group administration and health claim settlement package for Four-Phase Systems, Inc.'s IV-90 Mod 1 or 2 computers was announced here by Group Integrated Data Systems (Grids).

Grids software is said to offer administration and claim settlement systems codesigned to interlock with each other in a shared resource environment and provide full-service capabilities to group insurance operations.

Grids is an on-line interactive system. All policy issue, change and termination transactions reportedly are keyed directly from source documents under control of a set of screen formats containing the data elements necessary for identifying, maintaining and analyzing group policies.

The software also is said to handle employee control and maintenance functions, billing functions, premium collection and accounting functions, accounting listings and conservation functions. A claims settlement system includes on-line claim history, claim adjudication and claim processing.

Grids sells for $222,000, including all source and executable libraries, utilities and file structures, documentation, operating manuals, training and two man-months of custom tailoring. The vendor is headquartered at 80 Wall St., New York, N.Y. 10005.

Release 1.5.1 of 'Vimos' Offers Multiple Job Support

CINCINNATI — Software Clearing House announced Release 1.5.1 of Vimos, its program package that supports systems under NCR Corp.'s Virtual VRX operating system.

The vendor also unveiled a screen generator that reportedly allows programmers to do full screen Displays and Accepts on page-mode terminals with a single line of code.

New features of Release 1.5.1 reportedly include multiple job support, interactive batch processing, optional On-Line Programming Development (OLPD) support, automatic record level lockout for Criterion Access Methods files that are said to bypass the segment, sector and block level locks of Criterion Access Methods and automatic file Opens said to eliminate most of the delays associated with opening and closing files under VRX.

Vimos will run any Cobol-74 system coded for NCR interactive machines, the vendor said. An optional interface reportedly allows Vimos users to run either NCR's OLPD or Intrak's The On-line Programming Interactive Control System (Topics) development facilities from production terminals.

Screen-Tek, the new screen generator, reportedly has screen definitions that are built interactively, first by painting the screen then by answering questions about the names and editing requirements for each field, the vendor said.

Testing can be performed immediately without compilation, the vendor said. Once a definition is acceptable, Screen-Tek is said to generate a Cobol copy module containing the working storage layout for the screen.

The perpetual license fee for Vimos is $9,500. The optional OLPD interface costs $2,500. The perpetual license fee for Screen-Tek is $3,500, the vendor said from 771 Neeb Road, Cincinnati, Ohio 45238.

'Pro-Ject' Values Property

GREENWICH, Conn. — An on-line computerized property analysis service that detects the variables that measure financial attractiveness of property investment is available from the Service Bureau Co.

Pro-Ject provides banks, insurance companies, brokers, developers and corporations with the ability to assess the financial status of property. Data calculated includes individual tenant schedules dealing with different types of leases.

The Service Bureau charges a minimum monthly charge of $100 for its services from 500 W. Putnam Ave., Greenwich, Conn. 06830.

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Boston, MA	October 15
Buffalo, NY	October 29
Century City, CA	September 22
Chicago, IL	October 20
Columbus, OH	October 27
Costa Mesa, CA	September 29
Dallas, TX	September 29
Denver, CO	September 24
Des Moines, IO	September 15
Greenville, SC	October 15
Houston, TX	October 6
Indianapolis, IN	October 6
Kansas City, MO	November 4
Miami, FL	September 15
Milwaukee, WI	October 1
Minneapolis, MN	October 14
Nashville, TN	October 13
New York, NY	September 23
Omaha, NE	September 22
Philadelphia, PA	October 28
Phoenix, AZ	September 17
Pittsburgh, PA	November 10
Portland, OR	October 15
Richmond, VA	September 22
San Diego, CA	October 1
San Francisco, CA	October 6
Santa Clara, CA	October 8
Seattle, WA	October 13
Secaucus, NJ	October 22
Southfield, MI	October 22
St. Louis, MO	September 30
Tulsa, OK	September 30
Washington, DC	October 6
Winston-Salem, NC	October 29

International Seminars

Edmonton, Alberta, CAN	October 20
Halifax, Nova Scotia, CAN	October 6
London, England	September 15
Montreal, Quebec, CAN	September 29
Ottawa, Ontario, CAN	September 23
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'Fieldwatch' Manages Service

BURLINGTON, Mass. — Data, Inc. has announced a Cobol field service management system for Datapoint Corp.- and IBM-compatible equipment.

Fieldwatch is an on-line system that includes dispatching, inventory control, billing and management reporting modules, the vendor said.

Depending on the number of modules, Fieldwatch is priced from $50,000 to $175,000, the vendor said.

Data, Inc. is located at One New England Executive Park, Burlington, Mass. 01803.

Portfolio Accounting Aims at Wang Minis

GARDEN CITY, N.Y. — Loud Consulting Corp. (LCC) here developed Control, a portfolio accounting, evaluation and management software package that is available on a time-sharing basis or under license for Wang Laboratories, Inc. minicomputers.

Control reportedly is a menu-driven software package written in Ansi Cobol that supplies on-line data entry and an assortment of evaluation reports, transaction and cash journals, security and custodial inventories and Schedule D worksheets.

The vendor said Control also can be tailored to meet clients' specialized reporting and management needs, such as a tracking option and commodities trading.

LCC maintains the Control software, which can be accessed on the vendor's Wang VS minicomputer via remote terminals or under license on the user's own system.

Control also is available on a batch processing basis under which LCC provides all data entry, reports and services. An operator's manual and documentation are included.

Control is priced at $20/mo per account on a time-sharing basis and $25,000 for a one-time license. There is an additional 12% charge for maintenance, LCC noted from 600 Old Country Road, Garden City, N.Y. 11530.

Software Makes Kodak Terminal Plug-Compatible With IBM 5100

ROCHESTER, N.Y. — Eastman Kodak Co. has developed a software package that reportedly makes its IMT microimage terminal plug-compatible with the IBM 5100 series and provides users with electronic filing capability on a turnkey basis.

Previously users had to employ a general-purpose package or develop their own software to use the microimage terminal and the IBM 5110 or 5120 for electronic filing, the vendor said.

The software consists of several programs written in IBM Basic, which are said to perform the tasks necessary to support electronic filing. They include English text prompts and messages, menu-driven program functions, error messages and prompted screen formats.

The package is said to support up to eight separate applications per program diskette. For each document, the user can select up to 10 index fields and 52 index characters.

The total cost of the electronic filing system, including all hardware and Image-Link I program, would be just more than $30,000; the software alone sells for about $3,000, Kodak said from 343 State St., Rochester, N.Y. 14650.

Package Links Graphics, Tapes

ANAHEIM, Calif. — California Computer Products, Inc. is offering two functional software packages that allow Calcomp's Graphics COM systems to use Datagraphix, Inc. tapes.

Using the Graphsim/4020 and Graphsim/4060, Calcomp's 1581 and 1681 Graphics COM systems can process magnetic tapes formatted for Datagraphix SC4020 or SC4060 graphics COM recorder.

The two packages offer such features as command file processing and multiple character fonts. Each package is priced at $2,500 from the vendor at 2411 W. La Palma Ave., Anaheim, Calif. 92801.

Worldwide Service Tracks Ships' Safety

STAMFORD, Conn. — A computer service that provides information on the casualties and safety performance of ships and tankers throughout the world has been introduced by Mardata Maritime Data Network Ltd.

Available through General Electric Co.'s Mark III time-sharing network, the Ships Casualty Library includes reports on approximately 30,000 ships of 1,000 or more gross registered tons.

The service's on-line search capability allows the user to access the master computer for specific ship casualties reported since 1978 and tanker casualties reported since 1964. Mardata is located at 300 Broad St., Stamford, Conn. 06901.

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Two Software Products Released for HP 3000 Series

MONTREAL — Probe Software Sciences has released two software products into the U.S. marketplace: an English-language software for the Hewlett-Packard Co. 3000 series and an integrated business system.

The Natural Language/3000, featuring a natural syntax, reportedly allows users to build upon its existing English vocabulary or create instructions in French, Spanish, German or other languages. The software is aimed at unsophisticated users. Natural Language/3000 costs $9,500 plus $2,500/year maintenance.

SIP-3000 is comprised of 10 business applications, including accounts receivable and payable, general ledger, payroll, order entry, sales analysis, purchasing, inventory control, manufacturing and work-in-process.

Module prices begin at $6,000 and complete systems start at $100,000, Probe said from Suite 2102, 666 Ouest Rue Sherbrooke, Montreal, Quebec, Canada H3G 2A9.

Bunker Ramo Offers 'Adtran'

NEW ORLEANS — Bunker Ramo Corp. has announced Adtran, a package that automates administrative functions for branch banking applications. The firm also announced several hardware additions to complement the Adtran enhancements.

The software is an outgrowth of the firm's System 90 automated teller system. Adtran can operate as a stand-alone package or in conjunction with the firm's Banktran software. It operates with current System 90 components including video terminals, floppy disks and the PCU branch minicomputer.

In addition, the firm has announced a 256K-byte rigid disk unit, a letter-quality forms printer, a line printer and a plug-in math printer that also utilize the Adtran software.

Adtran application modules start at $2,500 and will be available in the fourth quarter, the vendor said from 35 Nutmeg Drive, Trumbull, Conn. 06609.

ISR Reduces Prices On Rims/MPG Units

CORAOPOLIS, Pa. — License fee reductions ranging from $600 to $1,800 on Information and Systems Research, Inc.'s (ISR) Rims/MPG family of application program-generated products are now available.

The vendor attributed the price reductions to the air traffic controllers' strike. ISR has offered an airfare reimbursement program whereby the cost of a prospective Rims/MPG licensee's round-trip airfare to the Pittsburgh-based office is fully deducted from the license fee of the product if a purchase occurs within 30 days of the demonstration.

Currently a double airfare reimbursement to any company that acquires one of ISR's software products is being offered. ISR is located at Airport Office Park, Building One, 410 Rouser Road, Coraopolis, Pa. 15108.

'Paxs' Prices Hiked

CINCINNATI — Software Clearing House has announced it will raise its prices for its Paxs system usage monitoring system for NCR Corp. systems using the VRX operating system.

The firm said the current $1,500 price tag for the product will be raised to $1,900 effective Aug. 1. The Paxs software was developed by Recon Systems, Inc. and is marketed through the Software Clearing House, the vendor said.

The vendor is located at 771 Neeb Road, Cincinnati, Ohio 45238.

Oil Industry Gets 'Oilauditor'

HOUSTON — A petroleum measurement table software package for the oil industry has been announced by Basic Resource Services, Inc.

Oilauditor contains subroutines that replicate some of the recently revised American Petroleum Institute Standard Measurement Tables and is available in Fortran and Ansi Cobol while being suitable for ticket calculations for both crudes and products as well as for meter-proving and tank-run ticket calculations, the vendor said.

Oilauditor is priced at $2,000 for the Fortran version and $2,200 for Cobol from Basic Resource Services, Suite 300, 1200 Blalock, Houston, Texas 77055.

Accounting Tool Aids System/34

PLYMOUTH, Mich. — An accounting package for the IBM System/34 said to include the ability to automatically retrieve releases from the major American auto makers has been announced by Louis A. Wright and Associates.

Release Accounting provides quick recap of release variances for management review and maintains cumulative release requirements, the vendor said.

Release Accounting is priced at $6,000 including RPG-II source, load programs and user documentation, the vendor said. Louis A. Wright and Associates is located at Suite 102, 496 W. Ann Arbor Trail, Plymouth, Mich. 48170.

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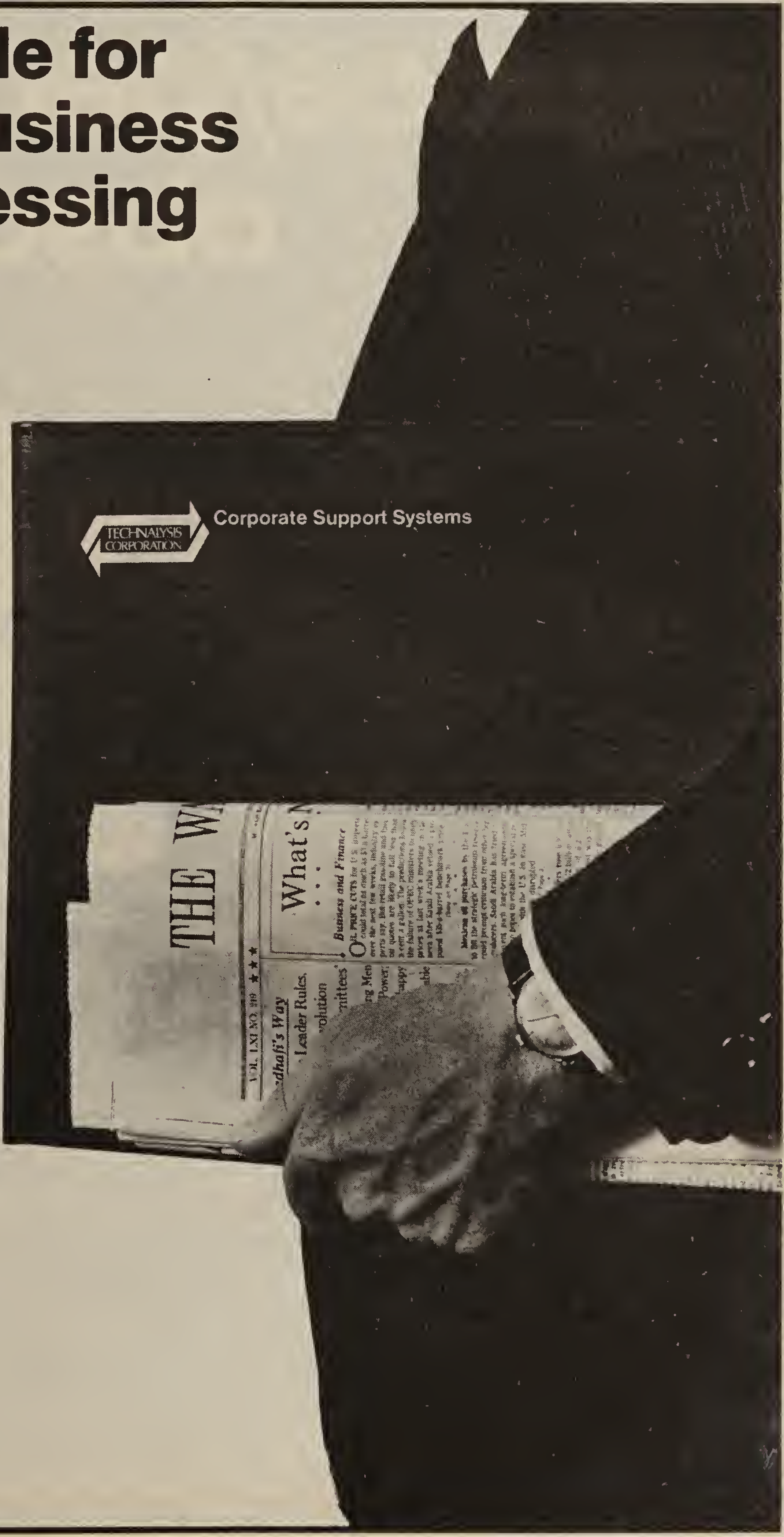

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Clark-Schwebel Fiber Glass Corporation
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Bently Nevada Corporation
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Random Notes

'PRS-1100' Maintains Data for Upgrades

BURKE, Va. — Datametrics Systems Corp. has announced the Performance Reporting Service (PRS-1100) for Sperry Univac 1100 systems.

The service maintains historical data and report trends for capacity planning and equipment upgrades. The service also consists of quarterly reports that summarize a standard set of performance measures, the vendor said.

The service costs $8,400, the vendor said from 522 Dunleigh Drive, Burke, Va. 22015.

Wang, Prime Get Closed-Loop System

NEW YORK — A manufacturing software system for users of Prime Computer, Inc. and Wang Laboratories, Inc. superminis has been announced by Comserv Corp.

The Advanced Manufacturing Accounting and Production System (Amaps) is a closed-loop manufacturing system of 11 modules designed for medium-size companies with sales in the $25 million to $100 million range, the company said.

The Amaps system is priced from $45,000 to $55,000 per module from Comserv Corp., 1385 Mendota Heights Road, Mendota Heights, Minn. 55120.

'Geomap' Illustrates Sales, Marketing

READING, Mass. — A computer mapping package said to allow users to read cartographic and attribute data files, categorize data and generate maps has been announced by Geographic Systems, Inc.

Geomap produces maps showing sales, marketing, demographic and economic data portrayed by Zip Codes, counties, census tracts or a company's sales territories, the company said.

Geomap is priced at $12,500 from Geographic Systems, Inc., 100 Main St., Reading, Mass. 01867.

Manus Utility Handles RSTS/E Disk Files

SEATTLE — Manus Services Corp. has announced DSKBLD, a utility package that reportedly optimizes disk file structure on Digital Equipment Corp. RSTS/E systems.

The utility analyzes the input disk file structure and copies it to the receiving disk while optimizing directory and data structures. In addition, the package can optimize data and directory structures, the vendor claimed.

The package costs $500, the firm said from the Lake Union Building, 1700 Westlake Ave. N., Seattle, Wash. 98109.

Ferguson Announces Spooling Program

MARINA DEL REY, Calif. — Ferguson Tool Co. has announced an "all-software" spooling program that reportedly runs on any printer attached to an IBM System/3 processor.

The package operates on the firm's Version 17 control program support for System/3 processors models 8 and 10. The firm took over Version 17 support after IBM announced it would discontinue support in October 1980.

The spooling package costs $25/mo and Version 17 costs between $47/mo and $149/mo. The vendor's mailing address is P.O. Box 9964, Marina Del Rey, Calif. 90291.

'GS-1000.2' Improves Processing Speed

DENVER — Auto-trol Technology Corp. has announced an enhanced release of its GS-1000 software for its AD/380 line of production and drafting processors.

Called GS-1000.2, enhancements include associative structures, enhanced refresh features and changes that allow data to be presented 50% faster than on the earlier package, the vendor said.

The software is included with AD/380 systems, which cost approximately $200,000, the vendor said from 12500 N. Washington St., Denver, Colo. 80233.

Payroll Service Performs Tax Reports

SAN FRANCISCO — Odin Data Systems, Inc. has announced a payroll service that performs tax reporting and basic accounting functions.

Targeted for firms with 50 to 10,000 employees, the service offers reporting of management data, general ledger account, job accounting and calculation of workmen's compensation insurance, the vendor said.

The service is billed on an as-used basis and is accessed through the firm's specialized terminals. Terminals cost about $5,000 each, the vendor said from Suite 205, 425 Bush St., San Francisco, Calif. 94108.

MTI Time-Sharing Offered in Dallas

DALLAS — A time-sharing order entry/inventory and accounting package for users in the Greater Dallas area is available from MTI Timesharing, Inc.

Resolve has full order entry, inventory availability determination, automatic back ordering, picking tickets and invoicing capabilities. It will interface with a complete accounting system, the vendor said.

Time-sharing costs vary with system use from MTI Timesharing, Inc., 2720 Stemmons Freeway, Dallas, Texas 75207.

Conference Board Data Base Goes T/S

FAIRFIELD, N.J. — Rapidata, Inc. has announced the availability of the Conference Board, Inc.'s data base on the company's time-sharing system.

The data base is a proprietary macroeconomic data base and a source of economic and market information within the business community, as well as a compilation of forecasts containing 800 numerical time series grouped into various indices, the company said.

The subscription cost for the data base is $450 annually for Conference Board associates and $600 for nonassociates from Rapidata, Inc., 20 New Dutch Lane, Fairfield, N.J. 07006.

Marketing Users Gain Time-Sharing Tool

ANN ARBOR, Mich. — Comshare, Inc. has announced Orion, a time-shared package that offers management tools for marketing analysis and planning.

The service offers analysis, forecasting and reporting tools that can be used for market planning, profit planning, brand performance analysis and new product introduction analysis, the vendor said.

Features include the ability to collate and consolidate information, comparisons of actuals and forecasts.

The service is billed on an as-used basis, the firm said from 3001 S. State St., Ann Arbor, Mich. 48106.

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Novation Adds Modem

TARZANA, Calif. — A $249 automatic answer, direct-connect 300 bit/sec modem has been developed by Novation, Inc.

The Bell 103-compatible Auto-Cat will communicate over dial-up telephone lines using a standard modular jack, according to the firm. It has three data modes: automatic answer, manual answer and manual originate. Operable in either full- or half-duplex mode, Auto-Cat is said to feature both local and remote loop-back test.

Novation is located at 18664 Oxnard St., Tarzana, Calif. 91356.

Diagnostic Tool Unveiled

ALTAMONTE SPRINGS, Fla. — A data communications diagnostic tool said to verify all electrical and functional characteristics of any interface and identify the cause of the problem has been introduced by Epicom, Inc.

The 350 Ferret also functions as a data monitor/emulator using synchronous, asynchronous, isochronous and other bit-oriented protocols, the vendor said.

With 30 to 60 days delivery, the 350 Ferret is priced at $3,750 from 592 N. Douglas Ave., Altamonte Springs, Fla. 32701.

Mux Satellite Option Offered

GERMANTOWN, Md. — Digital Communications Corp. has announced a satellite option for its Model CM9100 and Model SM9200 statistical multiplexers.

The satellite operation option allows asynchronous devices to communicate over a satellite link through the company's statistical multiplexers, with the bit synchronous protocol structured to compensate for the delays encountered in round trip transmission, the vendor said.

The satellite option is priced at $200 from 11717 Exploration Lane, Germantown, Md. 20874.

Green, Amber CRTs Introduced

MINNEAPOLIS — Large-screen green and amber CRT terminals designed with 18.6KHz horizontal video scan rates have been announced by the Teleray Division of Research, Inc.

The 15-in. CRT terminals are available in a single- or two-page editor, extended memory, APL/Ascii and 132 columns with nonvolatile programmble functions.

The CRT terminals are priced at $200 and $215, respectively, from Research, Inc., Box 24064, Minneapolis, Minn. 55424.

Major Industry Battle Brewing Over Wideband Dems Planned By Tymnet, SBS and Isacomm

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — A major battle is brewing over the end-to-end wideband digital electronic message services (Dems) announced by Tymnet, Inc., Satellite Business Systems (SBS) and Isacomm, Inc. earlier this month [CW, Aug. 10, Aug. 24]. A likely result is that it will take these firms far longer to get their services on the air than they anticipated.

One harbinger of what will probably happen came in a comment from Bob Harcharik, president of Tymnet, in a recent interview. Harcharik made it clear his company will oppose efforts by telephone carriers to obtain the frequencies needed to provide Dems.

The frequencies support local loops, officially known as "digital termination systems," (DTS) that connect the user to Dems facilities. The latter provide the intercity portion of the service.

Harcharik was interviewed shortly after United Telecommunications, Inc., the nation's second largest independent telephone company, announced it would acquire Insurance Systems of North America, which holds a 51% interest in Isacomm.

High Stakes

On the surface, what is emerging is the same sort of cat-and-dog fight among competing communications suppliers that has been enriching Washington lawyers for years. But much more is at stake than market leverage.

Harcharik pointed out that Dems will free the independent carrier, and his customer, for the first time, from dependence on the telephone network. In other words, they will no longer have to accept rate increases like the ones AT&T imposed earlier this year.

Furthermore, although Dems was designed primarily for users operating at 2,000 bit/sec and above, Tymnet plans to offer speeds as low as 110 bit/sec. Presumably the other carriers will do likewise, so this latest version of user's lib probably will apply to almost all data communications users.

But the benefits depend on the creation of a viable market in which non-Bell carriers can offer Dems, Harcharik argued. In his view, that means barring telephone company entry — particularly entry by AT&T.

For the Bell system, however, there are some equally compelling reasons to enter the Dems market.

One key consideration is the long-term threat posed by Dems to Bell's bread-and-butter business — voice communications service.

Bad for Voice

Harcharik believes that Dems, as presently specified by the Federal Communications Commission (FCC), is not a good medium for digital voice — basically because the signal requires too much bandwidth. But within the next few years, technology is likely to reduce the number of bits required to replicate the human voice.

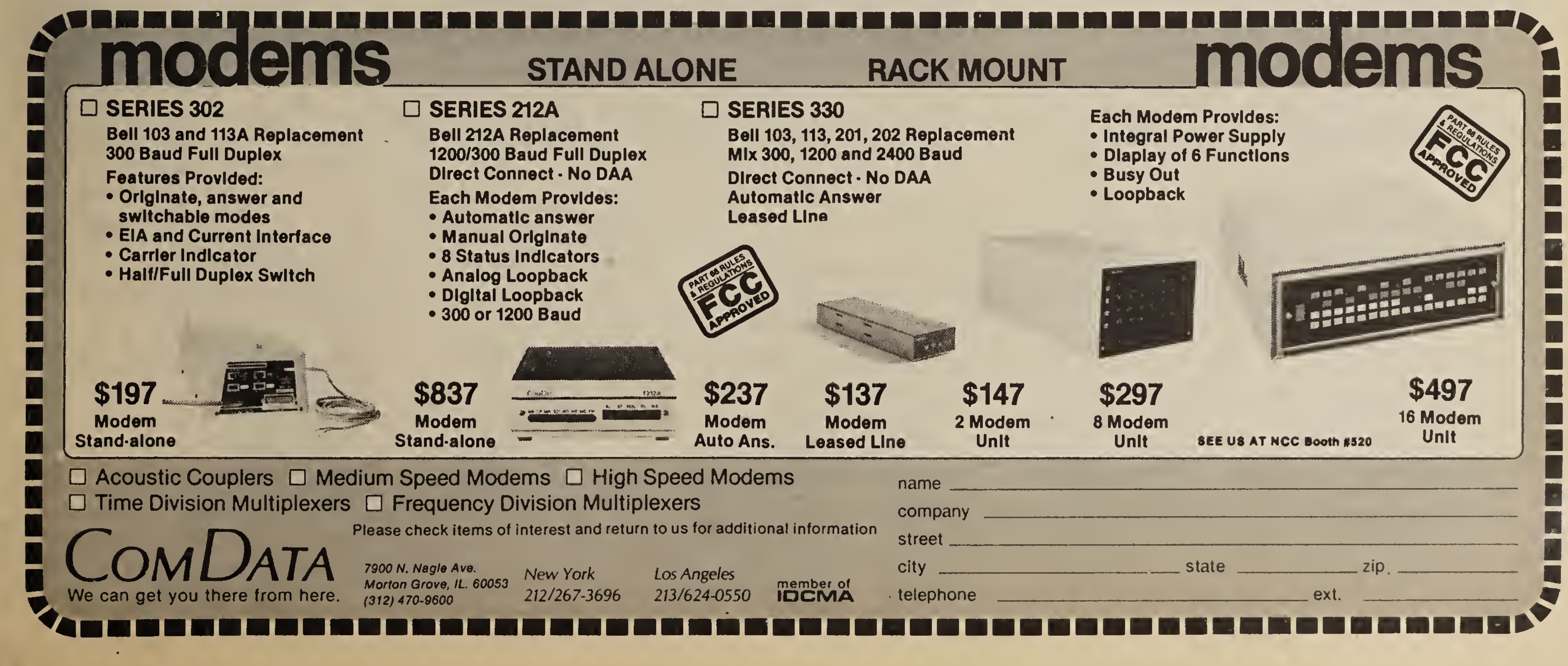
Meanwhile, the FCC already has decided to consider earmarking a portion of the 18 GHz frequency spectrum for Dems; this would be in addition to the 10.55 to 10.68 GHz band set aside last January in the commission's original order.

Digital voice transmission "may begin to be cost-effective at 18GHz," Harcharik said.

AT&T is planning to convert many of its existing local loops into digital transmission facilities during the next several years [CW, July 27]. By 1990, according to two of Bell's top network planners — Warren E. Falconer and Casimir Skrzypczak — 90% of AT&T's local loop plant will be capable of passing baseband digital bit streams back and forth between the user and the network, and long before then the company expects to be offering a combination of analog and digital transmission on these facilities.

AT&T local loop networks, once modified to handle digital transmission, might be superior to the DTS facilities planned by Tymnet, Isacomm and SBS. Bell would be able to support residential as well as business users. The phone company's charges, as a result, could be less than those levied by the competition, since Tymnet, Isacomm, and SBS are designing their systems only for business applications.

(Continued on Page 58)



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Raytheon Offers Impact Printers

NORWOOD, Mass. — Raytheon Data Systems Co. has announced two impact printers for the PTS-2000 intelligent terminal system said to achieve line printer speeds.

Running at 300- and 600 line/min, the printers reportedly produce clean 132-col printouts on single- through six-part forms. Each printer uses a 9 by 9 dot character matrix to overlap dots both vertically and horizontally.

The printers contain both Ascii and Ebcdic character sets.

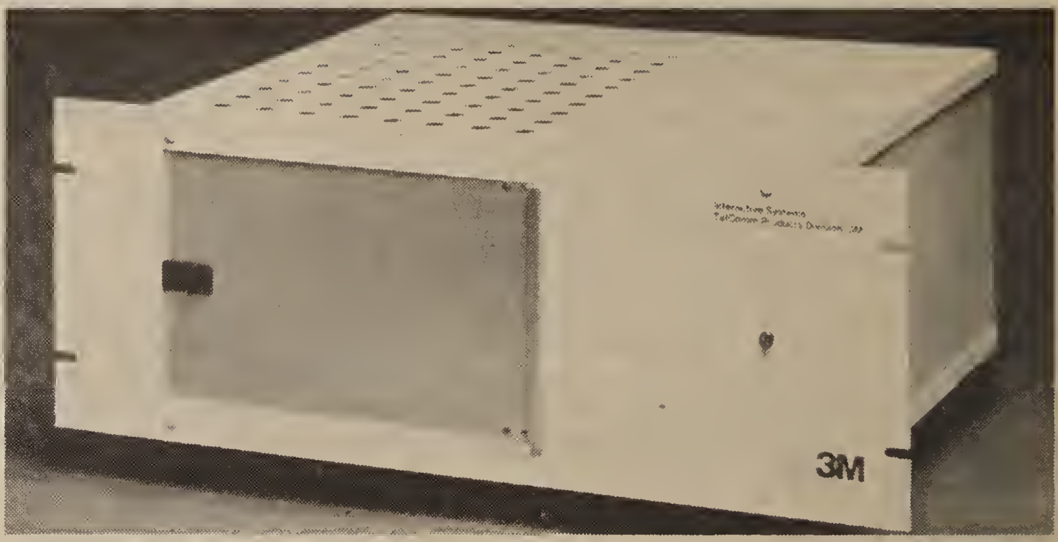
The 300-line/min version costs $9,100 and the 600-line/min version costs $13,000 from Raytheon at 1415 Boston-Providence Tnpk., Norwood, Mass. 02062.

Mux Introduced for 3274 Controller

ST. PAUL, Minn — Interactive Systems/3M Corp. has introduced a multiplexer that reportedly enables a "locally attached" IBM 3274 controller to conduct half-duplex communications with up to 32 remote 3278 or 3279 CRT terminals and 3287 printers on a single channel of a 3M Videodata broadband coaxial cable network.

The Model 6732 interfaces directly with the IBM 3274 terminal controller, multiplexing the 32 separate data signals into a single data stream for transmission over the cable, a spokesman explained.

This connection method is said to permit a user to install a Videodata network through a facility so terminals can be located "virtually anywhere" without dedicated cabling. A remote modem is used at terminal locations demodulating signals for up to 32 terminals.



The Model 6732 Multiplexer

Other data, voice or video channels can operate simultaneously with the IBM equipment on the network, the spokesman said, adding that the multiplexers operate at 2.36M bit/sec.

The multiplexer costs $6,295 from Interactive Systems/3M, Department TL81-16, P.O. Box 33600, St. Paul, Minn. 55133.

Battle Brewing Over Dems

(Continued from Page 57)

"The question of the circumstances under which telephone companies should be permitted to obtain DTS licenses in their own service areas . . . involves unique issues," the FCC said last January in its original decision on DTS/Dems. "We therefore make no policy determinations on telephone company entry here. The submission by a telephone company of a Section 214 application for a permit to construct DTS facilities will provide an opportunity for a thorough examination of . . . relevant issues."

United Telecom's upcoming acquisition of Isacom's parent company may provide the opportunity the FCC was talking about in the above quote. Comments to the FCC on the Isacomm application for authority to construct DTS facilities are due shortly.

Naruc Comment

The most significant comment may come from the National Association of Regulatory Utility Commissioners (Naruc).

Naruc is one of Washington's more powerful lobbies.

The association is convinced that the FCC has no business regulating digital termination systems, contending they are intrastate rather than interstate communications networks.

AT&T agrees with this position, while most other prospective suppliers of Dems disagree.

Naruc and AT&T have pursued common objectives many times in the past, and almost always they have been successful. The prime example is the Carterfone Decision, adopted by the FCC in 1968, but not really implemented until eight years later. That may prove to be a precedent for Dems.

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CAPACITY MANAGEMENT AND DP PLANNING:

A Basic Approach

By Barry Stevens

Capacity management is an important management procedure, both for data processing and for the users of its services. Its basic purpose is to ensure that the department has enough resources on hand to process a given amount of work within desired service level objectives. And, it must relate the cost of acquiring those resources to the levels of service provided. In other words, it can ensure that the DP function can do its job well and cost-effectively and can provide dependable service to its users.

Attempts to provide a precise definition for capacity have often produced lively discussion in conferences and workshops where competing approaches to the problem are advanced. However, there is a useful definition, widely accepted in the management community, which I will use in this paper: Capacity, ". . . from a physical view, is that amount of plant, machinery and equipment with which man-

(Continued on In Depth/3)

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(Continued from In Depth/1)

agement expects to operate a business. From an operating point of view, it also includes personnel employed to conduct the business."[1]

To implement this definition in a capacity management procedure requires analysis of the information provided, the process to be performed and the products required. This "input-process-output" relationship is presented in Figure 1.

Corporate planning provides DP with a *work plan* and a set of *service level objectives.* A technical specialist and financial analyst work together to execute the capacity management procedure. They produce performance projections, hardware and staff plans, budgets and capital requests. Most of these will be explained in some detail later in this article.

This broader view of capacity management is taken for two reasons. First, in implementing a capacity management procedure, it is helpful to tie it in with the rest of the DP planning process. Second, it is accepted that capacity management is related to budgeting and costing, and implementing it with that context in mind aids in cost/performance analyses.

The ability to illustrate the cost impact of specific levels of performance is one of the key benefits of an organized approach to capacity management. Decision making seems to get simpler when study results like these are available:

"Getting that work done overnight will cost 10% more than current expenses. Getting it done during prime shift will cost 25% over current budget.

"If we can live with 10-second average response time, it can be achieved at current levels of expense. Bringing the response time down to an average of three seconds will require a 30% increase in expenses."

Nowhere is the relationship between capacity management and the rest of the DP management process more clear.

In this article, the basics of planning and capacity management will be reviewed. One specific approach will be used to illustrate the entire process and to allow use of concrete examples. Each of the items in Figure 1 will be described in some detail. Examples will be taken from real-world implementations of the procedure. Other topics, such as work load characterization and simulation, will be reviewed and related to the overall procedure described here. Finally, this procedure and its relationship to strategic planning will be analyzed. References are given for those interested in greater detail.

Control of Variables

From a functional viewpoint, capacity management can be viewed as a procedure that controls the variables within the physical process called data processing. Changing those variables affects the way data processing behaves. The basic variables involved are illustrated in Figure 2. In this illustration, the work "flows" through DP, utilizing a certain level of resources. That utilization, together with other factors, creates a set of service levels for the work load.

Using Figure 2 as a guide, the capacity management process can be broken down into several tasks:

1. Identify and measure the resources to be included in capacity planning;
2. Identify, characterize and forecast the work load to be processed by those resources;
3. Identify service levels to be delivered from those resources, and project them during the capacity management process;
4. Compute the costs of providing the specific levels of performance desired.

By controlling the amount of resource available to process the work load, capacity management controls the service levels provided by those resources.

Basic Approach

In the approach described here, standard cost accounting methods are used to define the work of a DP organization, to compute the number of hardware and staff resources needed and to prepare the expense budget required to support them. Various work load measurement and characterization techniques may be used to aid in this portion of the effort. Next, simulation or analytical methods are used to make performance predictions. Finally, the resulting "system" of methods is used iteratively to arrive at satisfactory work plans, resource plans, expense budgets and performance predictions for DP.

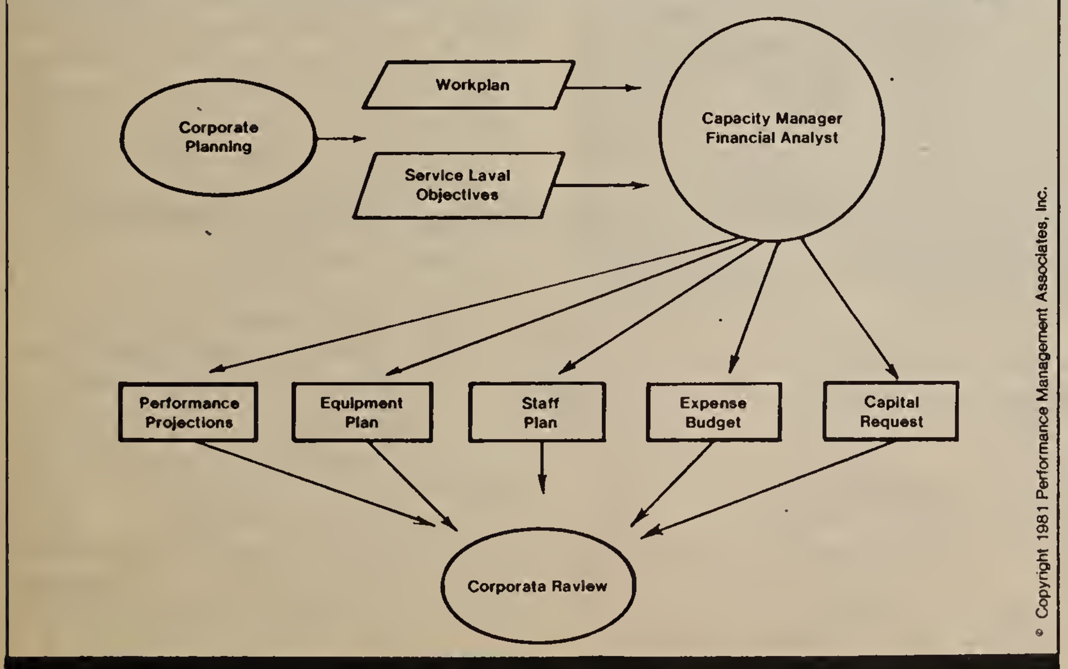


Figure 1

Users of this approach can make it as simple — or as complicated — as desired. Work can be simply defined, or very complex models can be built. At some installations, only hardware resources may be included. At others, the approach can cover people resources as well. And to satisfy the management definition of capacity, people should be included.

Examples used in this discussion have been taken from real situations, where implementations in Fortune 500 firms are under way. They mention specific types of hardware and software. Every attempt has been made, however, to keep the procedure described here vendor-independent.

DP Work Plan

The work plan should contain all items for which resources will be required. This includes development activities as well as operations. There are two major categories of work on the work plan: external items, related directly to the work submitted by any users of DP facilities, and internal items, related directly to the way in which DP has chosen to run its business. Each entry on the plan controls, in some way, resource use within DP.

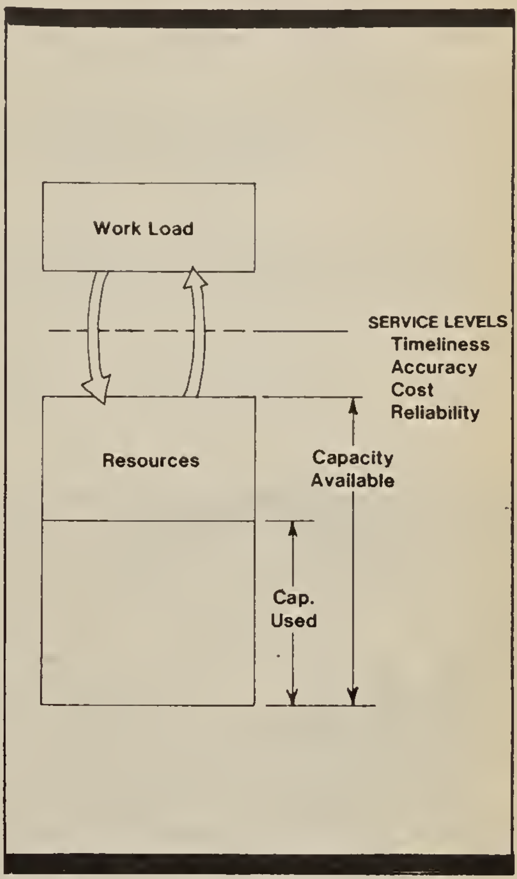
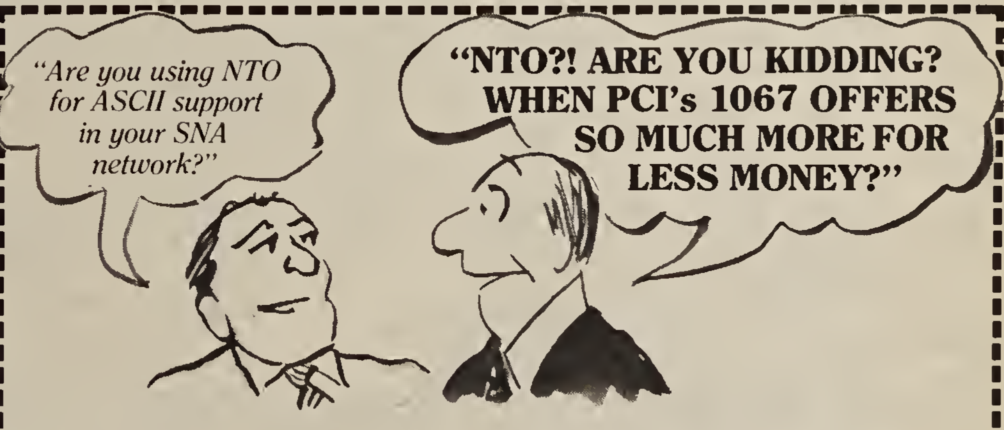


Figure 2: Basic Capacity Management Variables

In Figure 3, entries on a work plan for an IBM 370/158 shop, with a development group, remote job entry (RJE) capability, production and demand batch processing and a Time-Sharing Option (TSO) capability are presented. Samples include both user units of work and work items in DP terms.

Typical external, user-dependent entries include production and test jobs, the number of TSO users and the number of TSO and RJE sessions.

(Continued on In Depth/4)


"Are you using NTO for ASCII support in your SNA network?"
"NTO?! ARE YOU KIDDING? WHEN PCI's 1067 OFFERS SO MUCH MORE FOR LESS MONEY?"

"What do you mean?"

"The 3705 memory for NTO is outrageous. But PCI's 1067 is the same as any SNA/SDLC device. And what about being limited to one port per ASCII terminal?"

"The 1067 can support more?"

"Certainly. How about 7 ASCII terminals? . . .or 14? . . or 21? On a single 3705 port! And what about your APL problems?"

"You mean there's really APL support?"

"You bet! And you can run graphics terminals like Tektronix's and Cal Comp's. All those great ASCII graphics terminals. . .up to 9600 Baud."

"Wait a minute. What's this 9600 Baud stuff?"

"That's right. From 75 up to 9600. And I'm sure you know that NTO can only be installed in a 3705, but you can put a PCI 1067 anywhere."

"At the central site or anywhere I have SNA lines? Even with auto answer and speed detect?"

"Yep. And no more limitations to TSO. Now there's TSO, IMS, CICS, VSPS. . .everything."

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(Continued on In Depth/3)

User applications, such as payroll, are included if warranted; a separate entry is required for periodic, volume-related and permanent resource uses.

External work plan entries for the development function include new projects, maintenance changes and special (often unplanned) requests for "quickie" reports.

Internal or DP-dependent entries reflect the choices made by DP as to the way in which the organization and its work load are to be run. It may not be possible to directly relate the overhead resource use resulting from these choices to elements of the user work load. This is an important point. The purpose of this procedure is effective resource planning. *It is not a charge-back algorithm.* To plan effectively, it is only necessary to account for all resource use.

Categories of internal entries include the number of concurrent activities in both on-line and batch systems, resource uses that are fixed by policy and activities that are scheduled on a daily, weekly or monthly basis.

The number of simultaneous activities, called multiprogramming factor (MPF), multiprogramming level or concurrency, controls the amount of real main storage and disk transient storage used by the work load. If desired, an increment of processor use can be included to represent task switching overhead. In the work plan shown in Figure 3, an MPF is included for TSO, as well as for batch activities. The MPF, or at least its limit, is determined by the installation's operating scheduling and the maximum number of simultaneous activities determined by operations. In that sense, it is a policy decision.

There are other resource uses fixed by policy. The choice to use a specific version of the operating system, for example, is often made by policy. With that choice goes a portion of the processor dedicated to overhead and specific amounts of main and disk storage.

A final set of DP-dependent resource uses is controlled by periodic activities. Daily backups, start-up and shutdown routines or shift turnover meetings are examples of these. Monthly activities, or blocks of time that can only be allocated on a monthly basis, are included in this category.

Some of these entries will be expanded into a detailed characterization below to illustrate how they are used in planning computations. Before that is done, however, it is necessary to define the resources to be included in the capacity plan and the tasks or activities they perform.

Resource Groups

Each group of resources to be included in the capacity plan must be identified and specific details about them determined. In this approach, these are called work centers (WC), and sample WC definitions are presented in Figure 4 on In Depth/5. Actual WC definitions for a selected portion of a DP organization are shown. Not all WCs are shown, however, nor are all tasks or activities done by each. Both hardware and staff resources are included.

To simplify the definition and eliminate ambiguities, each WC should contain one type of resource (tape drives, people, processors), have one point of administrative control and have (at least) one nonambiguous measure of its use. In this approach, people WCs are measured in hours; CPUs are measured in hours; disk use in cylinders, or blocks; and storage use in blocks, kilobytes or kilowords.

The number of resources in each WC should be determined, along with the capacity of each unit of resource to perform work. The number of units times the capacity of each is the capacity of the WC.

This data can usually be obtained through interviews or analyses of available policy or operational information. Special measurement studies are not required at this point unless esoteric measures for capacity that demand such studies are used, such as CRUs, SRUs or Works.

The variable, fixed and overhead expenses should also be noted for each WC. Although budget information may exist at the WC level, it is not unusual to find that budget or ex-

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		Workplan Entry	Explanation
EXTERNAL - USER DEPENDENT	Operations	Production jobs	Production job processing.
		Test jobs	Test jobs submitted by development are also included.
		TSO users	Number of TSO users having charge numbers controls storage use and is included.
		TSO sessions	Length of each TSO session controls resource use.
		RJE sessions	Length of each RJE session controls resource use.
		Payroll - monthly	Monthly payroll cycle controls resource use that is not volume dependent.
		Payroll - checks	Monthly payroll check volume controls some resource use.
		Payroll - permanent	Payroll system uses storage on a permanent basis.
	Development	New projects	Number of new projects requested by users controls use of development resources.
		Maintenance	Number of maintenance changes is another factor in plan.
		Special requests	Number of unplanned reports is a plan item.
INTERNAL	DP-Dependent	MPF - TSO	Number of simultaneous TSO users controls storage use.
		MPF - batch	Number of simultaneous batch activities controls storage use.
		Policy	Resource uses fixed by policy, such as storage required by the operating system, and CPU overhead dedicated to it.
		Daily	Tasks done daily, not related to work load.
		Monthly	Tasks done monthly.

Figure 3. Example DP Workplan Entries

pense data has been prepared for higher level organizational units. To complete cost/performance analyses, it is necessary to treat cost information at the work center-level. In that way, as a specific resource is changed to improve performance, the cost of that change can be quickly and simply related to WC expense and total organizational expense data.

Variable expenses are those that depend directly on the number of resource units within a WC. These could include the monthly cost per person for telephone expenses, salary and benefit costs per person, monthly rental cost per tape drive or other resource-related expenses. Fixed costs are those that do not depend directly on the number of resource units, such as a fixed monthly charge for facilities or supplies. Overhead costs are those that are apportioned to the DP department from other organizational functions, such as personnel or office services.

Work Units

Resources within each WC are viewed as performing tasks or activities on behalf of the items on DP's work plan. In this approach, these activities are called work units (WU). Examples of WUs are also contained in Figure 4 on In Depth/5.

WUs for the development group are seen to be steps in the project life cycle, administrative activities, special studies and production program debugging. Production control performs job setups, schedules jobs, answers user calls and debugs production job failures. System programmers place "put tapes" on the system, conduct special studies, tune the system or debug system failures. The central processor expends CPU time on behalf of the work load. The tape drives expend tape allocation time. These WUs are internal descriptions of the work done by DP.

For each WU, an average, or standard value should be determined. These averages will be used, together with the DP work plan, to compute the number of resource units needed in each WC. This method has proved adequate for planning of overall resource needs. Work load characterization and simulation techniques should be used, however, in detailed work and configuration analyses. They can determine peak-to-average ratios, identify performance groups, link them to entries on DP's work plan and project service levels expected from the organization. These techniques will be summarized and appropriate references given below.

Data needed to determine standard values is usually available from a number of sources. In people WCs, average time per task may be determined using project management reports, personnel time records or special studies. Experience has shown that interviews with personnel, combined with observation of the tasks involved, can provide times that are sufficiently accurate, thus avoiding the unpopular issue of direct measurement of personnel activities.

For hardware WCs, data may be ob-

(Continued on In Depth/6)

	Work Center Names			
	Tape Drives	CPU	Disk	Operators
Work Units	Allocation Time	CPU Time	Permanent Space	Problem ID Problem Solve Mount Tape Change Forms Run Jobs

Figure 4: Example Work Centers, Work Units

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AU Name	Each AU Uses These WU
Prod158	2 or every 137 production jobs requires 0.05 hours of operator problem solving 0.00032 hours per job forms change time 1.98 operator Tape Mounts @ 0.017 Hours/Mount 0.0001 hours/job to pull production tapes 0.01938 hours/job CPU time 0.00824 hours/3800 printing 0.0019 hours OCR input 1.98 tapes per job @ 0.210 allocation hours each 0.02 hours scheduling, setup 0.03 hours/job data entry
TSO Users	11.38 cylinders of 3350 space per user
TSO Session	0.045 CPU hours per session 0.649 hours connect time 0.0011 hours technical support
MPFTSO	150 cylinders of transient 3350 space 20K of real main storage

Figure 5: Application Unit Definition

AU Name	Each AU Uses These WU
Payroll-Monthly	0.25 hours scheduling 0.15 hours setup 54 tapes mounted each month @ 0.017 hours/mount 54 tapes allocated each month @ 0.210 allocation hours each 1.75 CPU hours per month not volume-dependent 4 form changes per month @ 0.20 hours each 0.216 hours troubleshooting per month
Payroll-Checks	0.00015 CPU hours per check 0.00001 hours print time per check
Payroll-Permanent	1500. cylinders of 3350 permanent space

Figure 6: Application Unit Definition, User Units of Work

(Continued from In Depth/5)

tained from job accounting summaries, on-line accounting data or special measurement studies. In general, job accounting monthly summaries and some measurement data on overall system performance are sufficient enough to start using this approach.

Once the basic work plan has been defined and WCs and WUs identified, those internal activities must somehow be linked to the items on the work plan. This produces a detailed description of each type of work and the resources required by it. In this approach, these are called application units (AU). They are used to describe all work of the DP department, whether external or internal, and the detailed description of resources used includes people as well as hardware WCs. This description includes as a subset the natural forecast unit, business unit or user unit concepts, which have been publicized through software physics and other approaches to capacity planning.

Figure 5 above provides some examples of detailed AU definitions for entries on the DP work plan. A few of the entries will be explained in detail.

Production Job

Production job processing on the 158 (PROD158) is chosen to be one of the work plan entries. Each production job requires .0001 hours of console time. Two out of 137 jobs require debugging and/or problem solving at the console at .05 hours each incident. Each job requires .00032 hours of printer form changing and .00067 hours of decollating. An average of 1.98 tapes are mounted by the operators each job, at a standard time of .017 hours per mount. Tapes for production jobs are pulled in batches, requiring .0001 hours per job. Microfiche processing requires .0106 hours per job. Each job requires .01938 CPU hours and .00824 hours of 3800 printing. Other activities included in the AU definition are problem resolution, scheduling and job setup by production control and work done in the data entry function. This method of defining an "equivalent job" is an extension of that previously described by Jenkins and Howard.[3]

The number of expected TSO users (TSOUSERS) will have some impact on disk storage. Each user having a charge number is expected to occupy 11.38 cylinders of 3350 storage.

Similarly, the number of production applications maintained in operations has a disk storage impact. Each application is expected to require an average of 149 cylinders of permanent storage.

The number of TSO sessions may be used to show impact on the CPU, on communications facilities and on the technical support group. Each session requires .001550 hours of CPU, .649 hours of connect time and .0011 hours of technical support.

Multiprogramming factors (MPF) are used to show impact on storages. Each simultaneous user of TSO (MPFTSO) requires 150 cylinders of 3350 transient space and (approximately) 20K bytes of real main storage.

Certain resource uses are, in effect, set by policy. A POLICY AU can be used to show that the system and system-related activities require, for example, 3,191 cylinders of 3350 space, 120K bytes of real main storage and 220 hours (40%) of processor time.

Each of these AU definitions is in DP terms and uses information readily available from job accounting summaries, project management records, manual logs or personnel interviews. Another type of AU definition is possible and a sample of this definition is presented in Figure 6 on above.

In Figure 6, an AU definiton for payroll is shown. In this definition, all resource uses that are a function of the monthly cycle are grouped into a "monthly" AU and all that depend on check volume are grouped

AU Name	January	February	December
PROD158	5500	5528	5803
TEST158	535	540	603
TSOSESSION	9700	9814	10950
MOFTSO	20	21	25
MPFBATCH	14	14.5	16
PROAPPLICATIONS	105	106	117
PAYROLL-MONTHLY	1	1	1
PAYROLL-CHECKS	1000	1010	1090
POLICY	1	1	1

Figure 7: Example Work Load Forecast

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into a "check" AU. Forecasting and costing can then be done in terms familiar to the non-DP user.

While it is not always possible to define all applications in user terms such as these, or to define all DP resource uses in terms of user application units, this type of definition is very useful in moving capacity planning and strategic planning for DP closer together.

Forecasting Volume

After the work plan is defined and the link is made between items on that plan and internal DP resource use, the volume to be expected from each work plan item must be defined. A sample forecast is presented in Figure 7 on In Depth/6.

In that figure, several entries from the work plan are shown with their volume forecast. The production of job volume is seen to start at 5,500 jobs per month and rising to 5,800 jobs per month at year's end. The number of TSO sessions grows from 9,700 to 10,950 per month. The number of simultaneous users increases from 20 to 25. The number of employees receiving payroll checks rises from 1,000 to 1,090. The number of production applications supported rises from 105 to 117. The policy decision on the storage and processor requirements of the operating system remains unchanged.

Volume estimates for the DP-related items on the work plan are obtained from internal DP sources, such as job accounting summaries, production schedules or documentation, development groups or other support personnel within DP. Items that are in user terms are reviewed with the users, who in turn provide volume forecasts. Although initial efforts at forecasting with the users may meet with resistance, or might produce some wrong numbers, the forecast information should improve as participants get used to the procedure.

Computing Resource Needs

After data has been gathered, the nitty-gritty job of computing total capacity demand on each WC and computing the number of resource units begins. Although I won't try to describe the computations in detail, the basic form will be summarized using previous samples for WCs, WUs and AUs.

For every entry on the work plan and for each month in the forecast, the expected volume is used as a multiplier for each WU included in the definition of the item on the work plan. As an example:

For PRODUCTION158, January expected volume is 5,500 and CPU/Job is 0.01938 hours. Total CPU demand by production is: 5,500 X .01938 = 106.6 hours.

This time is totaled for all work plan entries using the CPU. When the computations are complete, the sum is the capacity demand on the CPU. This process is identical for all WCs. When a total demand on each WC is known, it is divided by the "capacity per resource unit," as defined above.

This yields the number of each resource required in each WC. This result is a static analysis of resource needs. Further analysis may be needed in hardware WCs to complete a dynamic analysis and ensure that peak loading conditions are met.

When the number of resource units has been computed, the expense information collected for each WC can be expanded into an expense budget. The number of resource units per month is multiplied by each variable expense line item and the result can be laid out in the standard 12-column, budgetary form. The fixed expenses are totaled, as are the overhead items. After the rows and columns are totaled, a final expense figure for the WC can be determined.

The total budget for each WC can be divided by its total capacity to compute a standard cost per each unit of capacity (C_u) such as cost per hour or cost per cylinder month.

$$C_u = \frac{\text{Total Budget}}{\text{Total Capacity}}$$

The utilization of the WC can be computed and divided into the standard cost per unit of capacity to determine a standard price (P_u) to charge for 100% recovery of costs.

$$P_u = \frac{C_u}{\text{Work Center Utilization}}$$

(Continued on In Depth/10)

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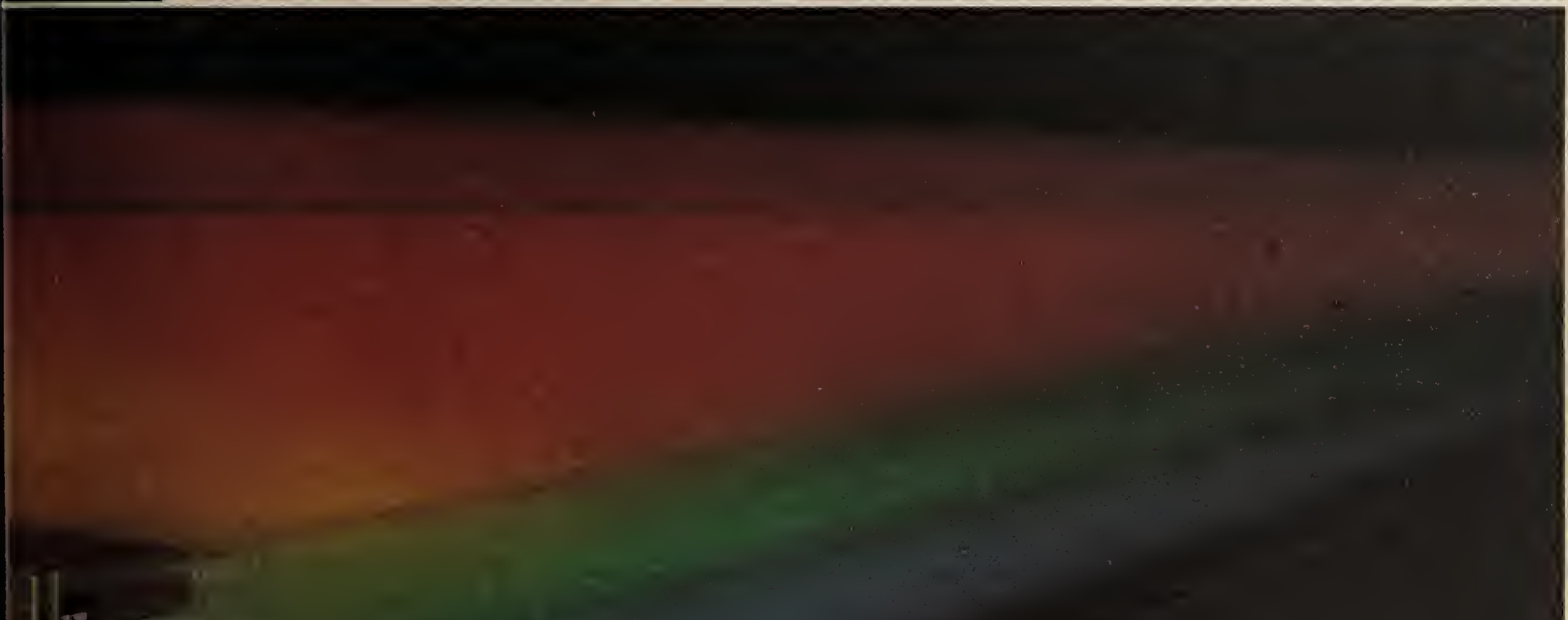

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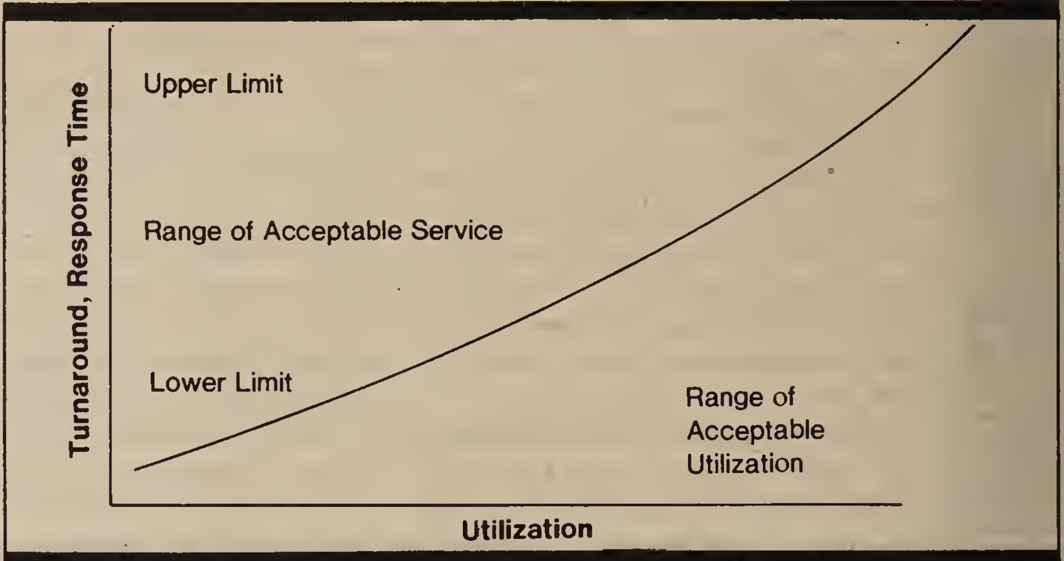

Figure 8: Service Level vs. Utilization

(Continued from In Depth/7)

The cost (and price) of each WU done within each WC may then be determined.

Finally, the standard costs or prices for WUs can be added together in the AU definitions to provide a unit cost or price in user-unit-of-work terms. This approach to planning, together with appropriate simulation methods highlighted below, can be used to give the users cost and performance information that can be used in their own planning and budgeting cycle and in strategic planning for the rest of the firm.

Service Levels

Once resource counts in each WC have been determined and WC utilization computed, service levels must be estimated. In the approach described here, average service levels may be determined directly from basic work load and utilization information. A measurement study may be conducted to relate the expected impact of work load volumes on resource utilization within DP.[2] That study can result in a service level graph similar to that shown in Figure 8. In the illustration, an overall work load measure is translated into resource utilization, if desired, and is plotted against a measure of service, such as turnaround time or response time. While the resulting curve may not take the form shown in Figure 8 at all installations, such relationships can be developed.

The object of the exercise is to use work load or utilization data from the overall planning process to find out where the installation is on this curve. As plan data shows increasing work and utilization, the point on this curve will change, and a new value for expected service levels can be obtained. Coupling this type of analysis with the budgeting process is a key step in producing cost/performance analyses.

At this level of detail, average response and turnaround times can be used. An old story says that "a man can drown in an average of one inch of water," and the message in that story applies to this method. Although average times and static analysis will be adequate for general planning purposes, more detailed analysis is needed to predict actual times in the face of work load peaks and configuration problems. Such analysis will yield additional amounts of resources, such as extra tape drives, or an additional portion of processor capacity which must be made available to handle a specific problem. The type of analysis depends entirely on the degree of precision required in the study. More discussion on this topic is presented in forthcoming paragraphs on level of detail and simulation.

Capacity Management 'System'

The steps described above, from resource definition through work load analysis and forecasting, resource computations, budgeting and service level projections, constitute a capacity management "system." Most DP organizations have some or all of these procedures in place. Few have them tied together in an organized procedure. But this "system," whether or not it has been implemented as a unified methodology, can produce the deliverables expected from the DP planning process.

Figure 9 illustrates the overall system that results when specific capacity management activities are merged with the planning and budgeting cycle.

The basic resource computation and budgeting activities can be used together with service level projection methods to analyze specific alternatives for work load or configuration and to arrive at cost/performance trade-off information. If, for example, a given configuration with a current hardware plan and budget provides a response time of 15 seconds, it may be desirable to analyze an alternative. This may be done by changing the resource descriptions (for example, upgrading the CPU) on changing the expense descriptions (for example, new monthly rental costs for the CPU, together with any changes in support personnel costs).

Further changes are then required in both the general and detailed work load description (for example, any data that is CPU-related is changed to account for the new CPU). Resource needs, budgets and new service level projections may then be produced.

The result can be a table such as the following:

	Existing CPU	New CPU
Budget Total	$8.9M	$9.8M
Response Time	15 sec	5 sec

At this point, of course, a value judgment is needed. Someone in the corporate review process must decide which alternative is desirable and whether the extra performance is worth the added cost.

Level of Detail

The complexity and level of detail for analysis of the work load and resources will depend entirely on what the analyst hopes to achieve by the process.[3]

The cost accounting based method described here has been found quite adequate for overall planning of resource needs. It provides monthly averages of hardware and staff requirements and can be viewed as a static analysis. The data to be gathered is quite straightforward, and the computations performed are easy and can be done with a pencil and paper. This approach can be used together with graphic projections for service levels based on average times.

If peak days during the month are to be taken into account, detailed analysis will be required. A monthly profile will have to be produced and peak days and peak resources identified. Selective, detailed studies of job accounting data will be required, coupled with special studies to capture service level data. The functioning of the operating system becomes important and will affect the outcome of the study. This can be viewed as a dynamic analysis.

If response and turnaround times are to be projected for all operating volumes and conditions, a very detailed analysis is required. Thorough descriptions of the work load and its use of resources will be needed. The behavior of the operating system will have to be understood in detail, and perhaps a simulation model mirroring that behavior constructed and used to project service levels. If averages and overall service levels are enough, simple data will suffice.

By tailoring the study to the level of precision needed, the analyst can save considerable time and money in the planning effort.

Basic Measurement

There are many references on measurement activities in DP. They range from detailed information on specific tools and techniques for measurement,[4] to procedures for inclusion of quantitative methods in the DP management process.[5] Literally hundreds of references are available.

Basic data collection activities in support of a capacity management effort include measurement of service levels,[6] work load measurement and characterization[7] and resource use measurement.[4]

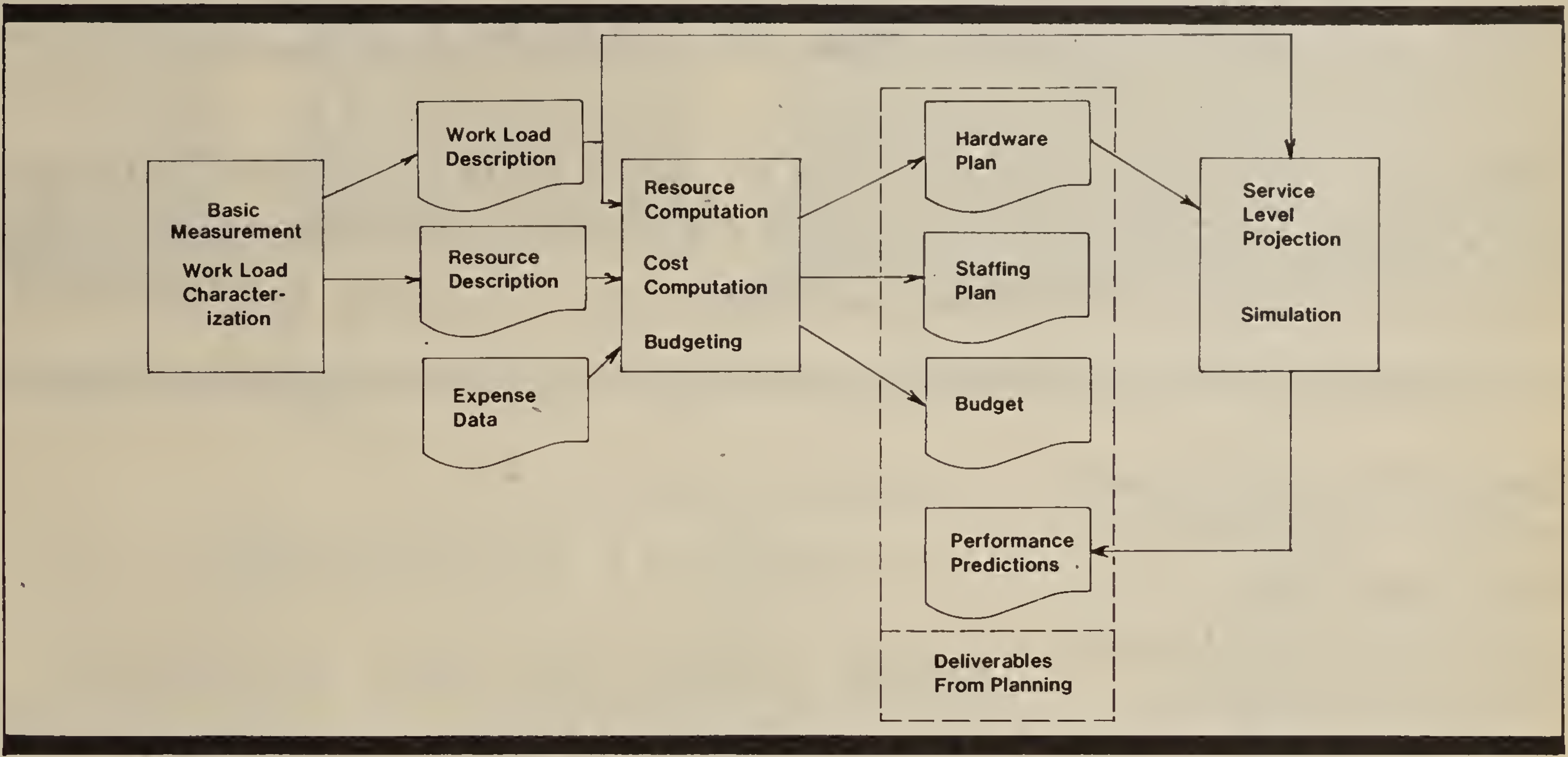

Figure 9: Capacity Management and the DP Management System

Once the work load has been defined, WCs and WUs determined and service level measures identified, a measurement plan can be developed. Existing data sources, such as manual logs, job accounting data or special measurement tools, can be used to provide several types of data:

1. Work load volume and frequency data.
2. Utilization of each WC and/or WU.
3. Service levels, such as turnaround time, response time, and on-time delivery of reports.

These data sources can be organized into a production system and treated as a production application to improve quality of data and reduce the effort involved in data collection.[8]

Work Load Characterization

Work load characterization is the analysis of work load data and identification of natural groupings of work with respect to use of single or multiple resources within a system. Job accounting data is analyzed and reduced to matrices of numbers that relate one type of resource use to another. The entries in each matrix cell are the number of jobs encountered in the accounting data that falls within the resource limits for each type of resource identified. Consider the following table:

	Number of Jobs With		
	Low CPU	Med CPU	High CPU
Low I/O	1,500	100	25
Med I/O	700	2,100	10
High I/O	500	50	1

If the number of rows and columns in the table is expanded, the number of jobs falling into each cell will not be evenly distributed, but will fall into natural groups, or clusters. If these clusters have been determined correctly, jobs whose resource needs match the characteristics of a particular cluster will probably receive the same performance as the cluster as a whole. These clusters of data are sometimes called performance groups. Specific work plan entries are often broken down into performance groups. IMS transactions, for example, are sometimes broken down into:

1. Trivial transactions.
2. One to two data base calls.
3. Three or more data base calls.

More categories can be used if clustering shows that more are needed.

References are available to gain a greater understanding of this ap-

(Continued on In Depth/14)

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October 5 (Day 1)

8:45-9:15 **Keynote**
A-1 Al Lay
President
Cado Systems Corporation

9:15-9:45 **Coffee Break**

9:45-10:45 **Mini & Micro Based OEM Business Update**
A-2 Lawrence Chimerine
President
Chase Econometrics, A Div. of Chase Manhattan Bank

Richard Raysman
Attorney/CBN Columnist
Brown & Raysman

8:45-10:45 **The Magic of Sales**
A-3 Robert Hardy
President
Computer Composition International

11:00-12:00 **OEM Survival Tools for the 1980's**
A-4 Jack Keen
Director, Management Products
Input

11:00-12:00 **Acquisition and Diversification**
A-5 Gilbert Mintz
Partner
Broadview Associates

Robert J. Conrads
Principal
McKinsey & Company

12:00-1:30 **Luncheon**
Art Holst
Author/NFL Official
"The Challenge of a Pro"

1:30-2:30 **Influence of Growing Local Networks (Part I)**
N-1 Chairperson:
Robert Wickham
Vice President, Marketing
Vector Graphic, Inc.

Robert D. Brannon
Marketing Manager
OEM Microcomputer Systems
Intel Corporation

2:45-3:45 **Influence of Growing Local Networks (Part II)**
N-2 Dr. Harry Saal
President
Nestar Systems

Ivan Socher
President & CEO
Amdax Corporation

2:45-3:45 **Intelligent VDTs and Desktop Systems**
N-3 Jon R. David
President
Systems R & D Inc.

Brian Green
Regional Director
Tandem Computers

1:30-2:30 **Input/Output: Market & Technological Structures**
T-1 Joseph G. Morris
Senior Vice President
Ramtek

Meldon K. Gafner
Director of Marketing Communications
ISSCO

Peter Eisenhauer
Vice President, Marketing
Integral Data Systems

2:45-3:45 **Mass Magnetic Memory: Market & Technological Structures**
T-2 Chairperson:
Andrew Roman
Consultant
Random Access International

Larry Hemmerich
Vice President
Cipher Data Products

4:00-5:00 **Voice I/O and Other Analogue I/O: Market & Technological Structures**
T-3

Len Magnuson
Vice President, Marketing
Centigram

Edward O'Neil
Marketing Manager
Voice Products
Interstate Electronics

1:30-2:30 **Retail Outlets**
O-1 David Pava
President
Byte Industries

Philip L. Reed III
General Manager
On Line Microcenters

2:45-3:45 **Are You Ready for An Ad Agency?**
O-2 Chairperson:
Thomas Casalegno
Publisher
Computer Business News

Robert McCullough
President
Aitkin-Kynett/SCB

Steven Tatum
Director of National Marketing
Televideo

4:00-5:00 **OEM Agreements**
O-3 Sonny Monosson
Chairman of the Board
American Computer Group, Inc.

1:30-2:30 **Application Generating Tools**
S-1 Chairperson:
William R. Stow
President
CPU International

Kent Lawson
President
Magna Systems

Chuck Butkus
President
The Software Factory

2:45-3:45 **Software Managment Strategies**
S-2 James Pettinger
Consultant/CBN Columnist

Stephanie Rosenbaum
President
Tec-Ed

4:00-5:00 **Application Dynamics: Planning for Changes**
S-3 Gary Long
Partner
Lupper & Long

1:30-2:30 **Microcomputer Trends**
P-1 James J. Farrell III
Manager, Technical Communications
Motorola, Inc.

Casey Powell
General Manager
Special Systems Operations
Intel Corporation

2:45-3:45 **Legal Aspects of the Third Party Market**
P-2 Peter Vogel, Esquire

4:00-5:00 **Desktop Computers**
P-3 Allen Michels
President
Convergent Technologies

1:30-2:30 **IBM Watch**
C-1 George Pazloff
Director of Value Added Remarketing
General Systems Division
IBM

H. W. Mattison
Program Manager
Value Added Remarketing
General Systems Division
IBM

Paul H. Espersen
Series 1 Technology Consultant
IBM

2:45-3:45 **HP Watch**
C-2 Bob Kresek
Marketing Manager, Worldwide
Third Party Sales
Hewlett Packard

4:00-5:00 **TI Watch**
C-3 Dr. W. Kenneth Wickham
OEM Marketing Manager
Texas Instruments

October 6 (Day 2)

8:30-9:45 **Japanese Vendors "Meet the Press"**
B-1 Thomas Hodson
National Sales Manager
Canon USA, Inc.

John Rehfeld
Vice President
Information Systems Div.
Toshiba

J. Garrett Fitzgibbons

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10:15-11:15 **Software: The Growth Area of the Decade**
B-2 Ann Winblad,
Marketing Director
Product Planning
Open Systems, Inc.

James Pettinger
Consultant/CBN
Columnist

10:15-11:15 **Financing Your Business and Product Development**
B-3 Gordon Rapkin
Chief Executive Officer
AMSI

11:30-12:30 **Sales & Marketing Planning**
B-4 Howard Levin
Director, Systems
Marketing
Arrow Electronics, Inc.

11:30-12:30 **Stop Giving Away Services**
B-5 George McArthur
Sales Manager
Decision Data

12:30-2:00 **Luncheon**

William Moore, Jr.
Vice President, Computer Operations
Perkin-Elmer Corporation

"Technology Futures"

2:00-3:00 **Europe as a Market**
M-4 Christopher Codrington
Interco Business Consultants, Ltd.

3:45-4:15 **Beyond the European Market: The Next Step?**
M-5

2:00-3:00 **PR: The Unified Corporate Philosophy**
U-4 Chairperson: Vic Farmer
Editor
Computer Business News

Carole Ely
Sr. V.P., Communications
Vector Graphic, Inc.

Mark Nigberg
President
The Nigberg Corporation

3:15-4:15 **Office Automation: One Stepping Stone Beyond WP?**
U-5 Phil Roybal
Manager, Computer Programs
Apple Computer

Thomas R. Sinopoli
President
Thomas R. Sinopoli Assoc.

2:00-3:00 **Special ADAPSO Session**
P-4

2:00-3:00 **Sourcing Software**
S-4 William Grinker
President
American Computer Group, Inc.

3:15-4:15 **Watering the Software Desert**
S-5 Ben J. Dyer
President
Peachtree Software Inc.

Barbara L. Stafford
Director, Sales & Marketing
TCS Software

2:00-3:00 **DG Watch**
C-4 Patrick Dodds
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Al Ormiston
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Richard R. Farwell
Director Mktg. Support
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3:15-4:15 **DEC Watch**
C-5

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(Continued from In Depth/11)

proach.[3,7,12] A software product, IBM's SMF Selectable Analyzer, may be useful in creating the matrices described above.

Simulation

Simulation of DP systems is, in general, a method of predicting how a given work load will perform on a particular computer system. A model of the system and its work load is constructed and is used to determine throughput, service times and utilization of resources. There are two basic types of models.

Analytic models rely on a mathematical description of the work load and system. The description is then used to compute predictions of system performance. Dunlavey has described these models in a useful survey article.[9]

Analytic models are available as software packages, for instance, Best/1 from BGS Systems, Inc. and Cads from Information Research Associates, Inc.

Discrete event simulators build a physical representation of a system. They send a series of physical representations of jobs through it and keep statistics on the result. This approach is discussed by Chandy in *Computing Surveys.*[10] Software packages such as IBM's GPSS package or Scert from Performance Systems, Inc. can help in this effort.

It isn't necessary to throw away every existing management procedure you have and start over again to implement a capacity management system. Existing planning, budgeting procedures and measurement tools can probably be worked into a reasonably orderly "system." Cost/performance studies are time consuming, however, and you may want to automate some of the nitty-gritty computations involved. Brooks has described the basic requirements for such an automated method.[11] Such computations have already been automated, and the program is available — Costanalyzer, from Performance Management Associates, Inc.

The collection and organization of data for such an approach appears to be overwhelming. It isn't. Typical data gathering times for the basic approach outlined here have been from one to three weeks. If special work load characterization or simulation studies are needed, of course, additional time is required.

The key to rapid implementation is to start simple, using as little detail as possible to put a basic computational framework in place. Using this framework, resource needs and budget information can be computed and related to service level information. If analysis shows that more detail is needed, work load characterization, measurement and simulation techniques can be added at specific places throughout the "system" until the desired result is achieved.

If you elect to try a cost accounting-based approach as described above, you'll get an extra benefit. It will be possible to use job accounting data to indirectly measure personnel utilization. As work in each particular category appears in job accounting data, the standard times for each task in a people WC can be accumulated for each WC. The total times so accumulated can be translated into utilization of the work center, without direct measurement of the people involved.

Strategic Planning

A capacity management system such as described here can be used as an aid in strategic planning for DP. Specific work plans can be developed and "run through" the system to determine resulting resource plans, costs and performance. Technological changes can be tried out by making appropriate changes to work load descriptions, resources and expenses, then using the system to produce cost, plans and performance data. If all steps in the process are automated, the system becomes a particularly powerful planning tool.

To be more useful in the strategic planning environment, the units of work in which the DP work plan is prepared should be examined. Instead of the DP-oriented terms shown in this article, the business units of the firm as a whole should be used. Instead of "jobs," "transactions," "sessions" and "MPFactors," units such as "number of items

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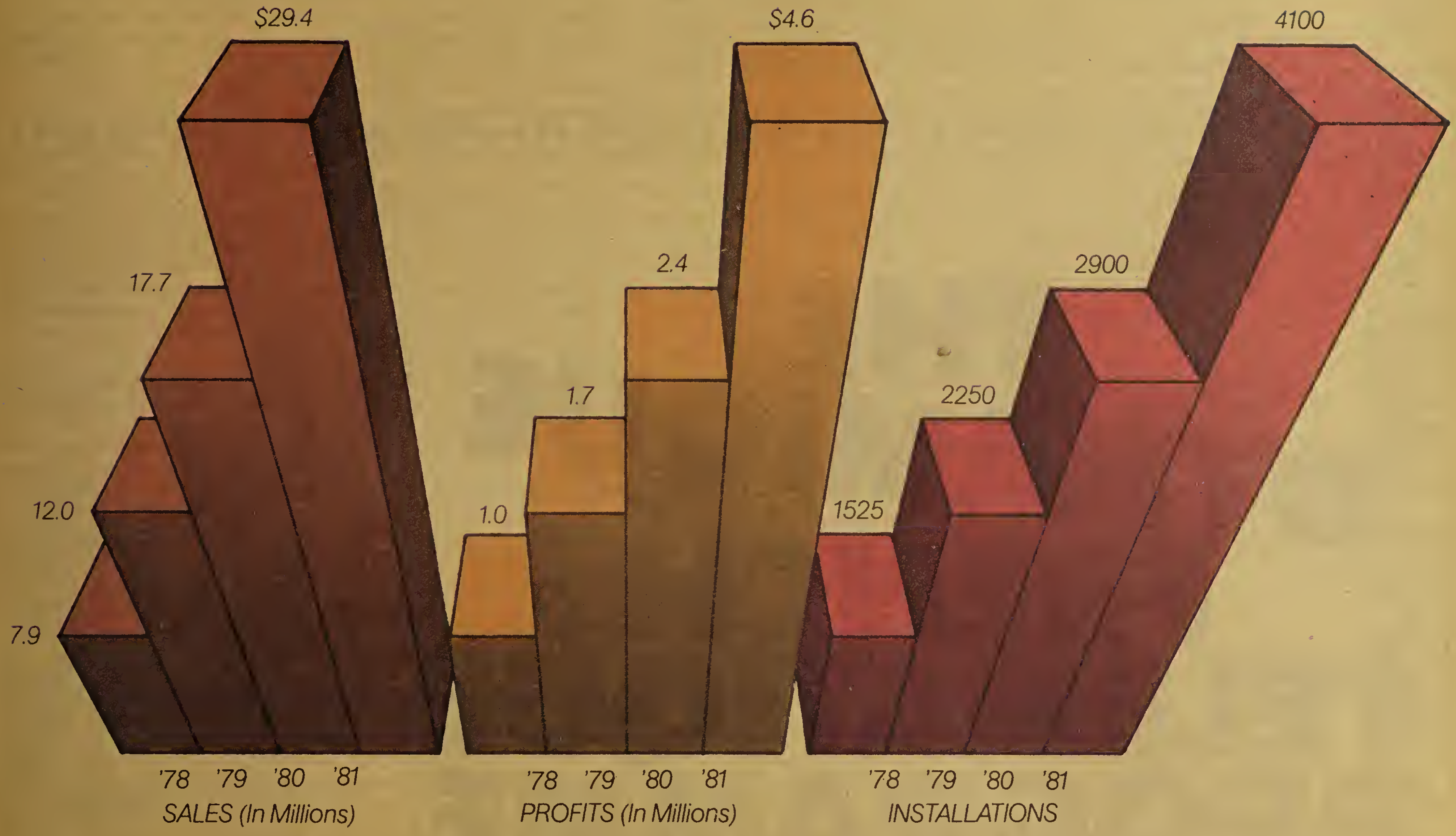

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(Continued from In Depth/14)

shipped" or "number of employees" should be used. This will require careful analysis of the business of the firm and its relationship to the DP work load.

Conclusion

In this article, we have tried to provide a basic framework for a capacity management effort, and to tie that framework to the rest of the DP management system. Basic techniques for analysis of work load and estimation of service levels were defined, but not described in any detail. Specific references were provided to enable the interested reader to get additional detail. Use of the overall capacity management "system" was described, including cost/performance analyses and its use in the strategic planning process.

Use of a thorough and disciplined approach such as that described can have significant impact:

- It reduces the time and manpower needed to produce plans and budgets. The initial model can be built in a few weeks. If automated, each iteration in a planning cycle can be completed in a matter of minutes.
- Both hardware and people resources can be easily included in planning.
- The approach used can be easily explained to non-DP management.
- Forecasting and planning can be done directly in user terms as much as possible.
- Cost/performance trade-offs can be easily computed.
- The approach can start simply and add only as much detail as required to produce satisfactory results.

Careful analysis of your planning and budgeting approaches, then, could potentially yield significant benefits for your organization.

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About the Author

Barry A. Stevens is principal consultant for Performance Management Associates, Inc. (PMA) in Scottsdale, Ariz. PMA provides consulting services, seminars and software products to improve productivity.

He is the creator of the methodology for DP management documented in Management Control of EDP Performance, *published by Applied Computer Research in Phoenix. He has served as associate editor of the "EDP Performance Review," was president and director of the Computer Measurement Group, has been active in Share and is a member of the Association for Systems Management. Stevens holds a bachelor's degree in electrical engineering from the University of Connecticut.*

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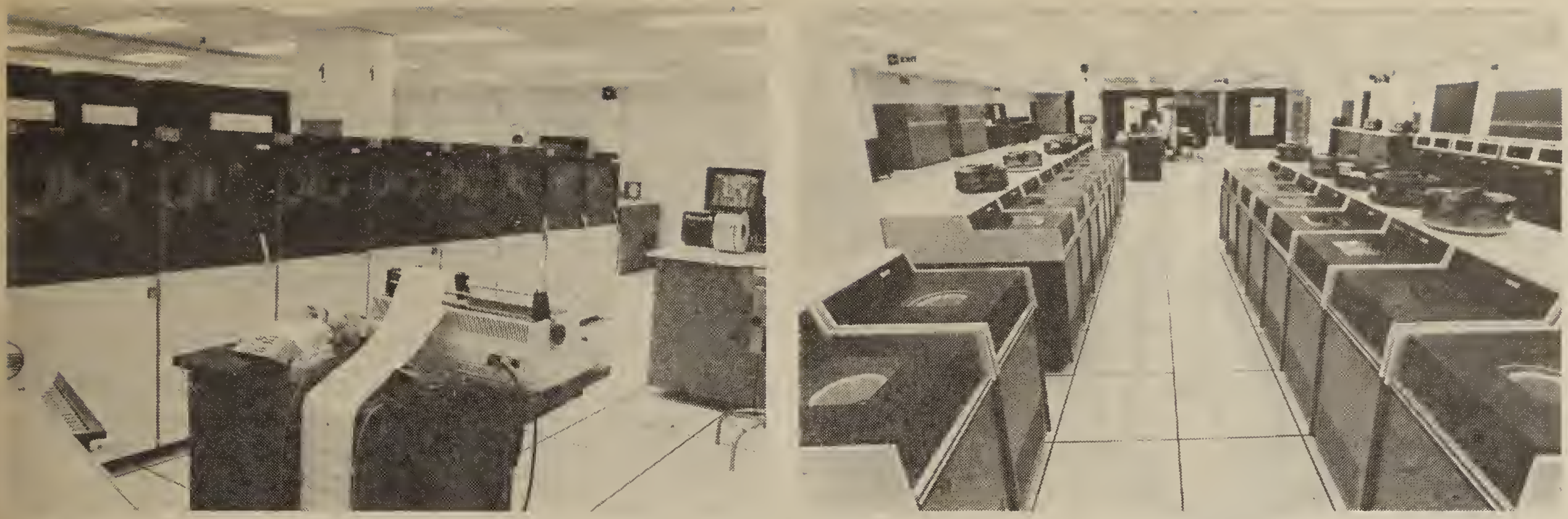


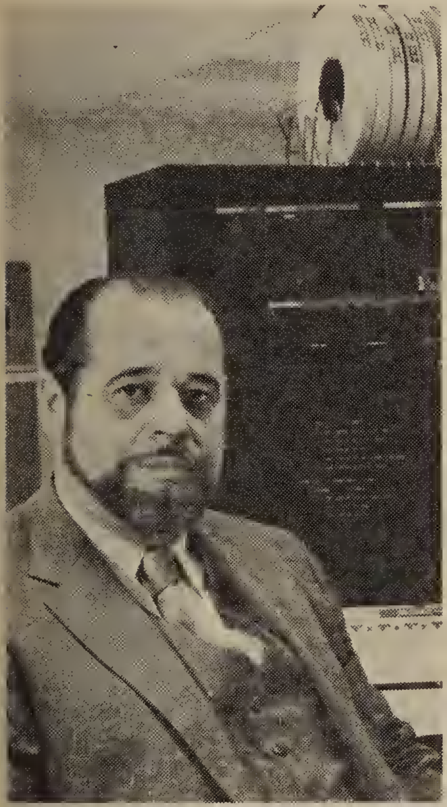
Now housed in Colonial Penn Group, Inc.'s main Philadelphia office, the makings of a Honeywell Level 66 backup center will be moved to a new site by Jan. 1. The configurations currently consists of three Level 66 processors, 24 Honeywell MTU0600 tape drives and 24 MSU0451 disk drives. Colonial Penn said the center is the first of its kind exclusively for Honeywell users.

Insurer Decides to Ensure DP Operation

By Tom Henkel
CW Staff

PHILADELPHIA — What happens to a big insurance company if its computer system is destroyed?

That question has been rolling around in the heads of top DPers at the Colonial Penn Group, Inc. insurance company. The answer always comes up the same — chaos.



Nicholas Chronis

For that reason, the firm's Data Group decided to rebuild its computer system, complete with redundant data, at another site. The firm also decided that other users might be able to take advantage of the backup computer center. It therefore decided to lease space in the backup center for redundant data from other companies.

Backup Concerns

Colonial Penn uses Honeywell, Inc. Level 66 processors, a line of processors that apparently lack a live backup center. The subject, which has caused concern among some users, came up recently at the April meeting of the Honeywell Large System Users Association in Washington, D.C.

Colonial Penn, seeing the potential to make a profit on its own backup center, recently decided to offer space to other users through Hawthorne Computer Services, Inc. — a marketing arm of its Data Group.

However, at this point, the Colonial Penn backup center is still in the planning stages. A spokesman for the firm said company officals still have not decided on a specific site for the center, other than to say it will be separate from the current DP facility, and that a specific opening date for the center has not been set.

The spokesman said the firm hopes to have an operable center by early 1982. The firm's promotional material states the center will be operative by Jan. 1.

The center will consist of three Level 66 processors with about 8M bytes of main memory. The center will house 24 magnetic tape drives, which run at up to 6,250 bit/in. and 24 Honeywell MSU0415 234M binary coded decimal character (157M bytes) disk drives. Other unit record devices are also planned to support most standard configurations, the Data Group said.

Additional Hardware

Aside from that basic configuration, client users will have to supply any additional hardware necessary to resume live operation in the event of a disaster. Hawthorne Computer Services said, however, it will supply any special hardware for a pass-through fee on the monthly charge for the service.

The center will house peripheral controllers capable of dividing the facility into three separate single-processor systems, each with 2M bytes of main memory. Hawthorne will market subscriptions to these configurations singly or in combinations of two or three. In addition, technical and operations support personnel will be available at the backup site for subscriber companies, Hawthorne said.

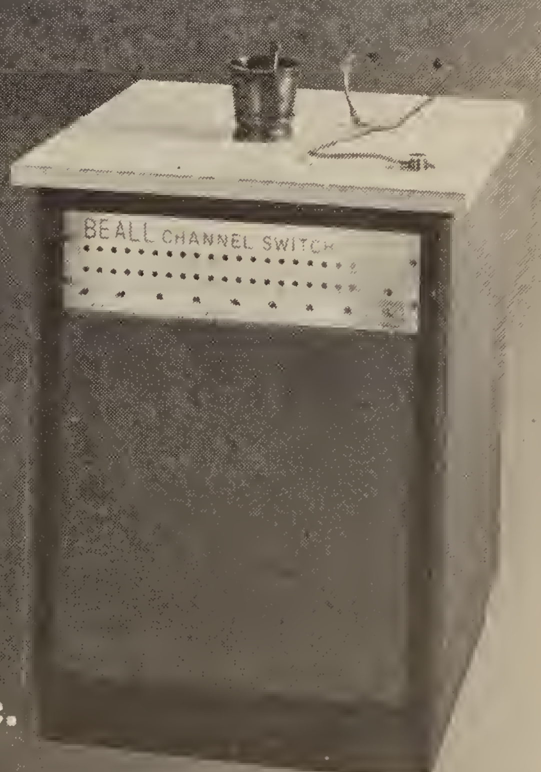
Extra space is planned in the facility for companies that need to use the backup center for an extended period of time — while a destroyed data center is rebuilt, for example, the firm said.

Portions in Place

Major portions of the backup configuration are already in place at the Colonial Penn facility in Philadelphia. When a separate 300,000 sq-ft location is found, the system will be moved, one system at a time, to the new facility, Hawthorne Vice-President Nicholas Chronis said.

Hawthorne expects to have 90 Honeywell subscribers by the end of 1982, and the facility is capable of supporting about 25% of the entire Level 66 installed base, he said. So far, the firm has not actively solicited

(Continued on Page 60)



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Matrix Printers Operate At Up to 340 Char./Sec

BENTON HARBOR, Mich. — Printek, Inc. has announced the 90 series, a two-model family of matrix printers that print at speeds up to 340 char./sec.

The Model 910 prints at up to 170 char./sec with a throughput of 140 line/min. The larger Model 920 prints up to 340 char./sec with a maximum throughput of 140 line/min, the vendor said.

In a graphics environment, the 910 prints up to 2,000 dot/sec and the 920 prints 4,000 dot/sec. Shared print features includes a 9 by 9 dot format, a graphics density of 114 by 114 dot/in. and a 96 Ascii character set with optional fonts, the vendor said.

The 910 costs $1,695 and the 920 costs $2,345. The units will go into production in the fourth quarter, the vendor said from 1517 Townline Road, Benton Harbor, Mich. 49022.

Workstation to Drive Nicolet Zeta Drum Plotters

CONCORD, Calif. — Nicolet Zeta Corp. has announced an off-line/on-line plotter workstation, the C63, that will drive the firm's 36-in. and 54-in. drum plotters.

In an on-line mode, plot files may be transmitted over telephone lines and written to tape for later plotting. The unit will also function as an on-line controller, passing plot files directly to the plotter, the firm said.

The C63 comes with a read/write nine-track 800/1,600 bit/in. tape drive, full Ascii keyboard with special keys for plot control function and an integral CRT terminal. It costs $19,900, the vendor said from 2300 Stanwell Drive, Concord, Calif. 94520.

Power Line Conditioners Boast Heavy Output Power

SAN DIEGO — The Deltek Operation of Gould, Inc. has introduced a group of ac power line conditioners with 120/240 Vac output power.

The six line conditioners, part of the DLC series, are available in sizes from 3 to 20 KVA and protect systems from damage and malfunction due to noise spikes, power surges, voltage sags and brownouts.

Prices range from $1,495 to $5,375 depending on the power voltage. The vendor can be reached at 2727 Kurtz St., San Diego, Calif. 92110.

Insurer Ensures DP Operation

(Continued from Page 59)

subscribers, Chronis added.

Monthly subscription rates range from $3,200 to $7,250. There is a service initiation fee of $15,000 to $50,000 depending on the configuration and the hours of notice given. There is a daily service fee of $2,000 to $5,000. The latter two charges are usually covered by "extra expense" insurance, and is not an out-of-pocket expense to the subscriber, Chronis said. Hawthorne Computer Services is located at 1234 Market St., Philadelphia, Pa. 19181.

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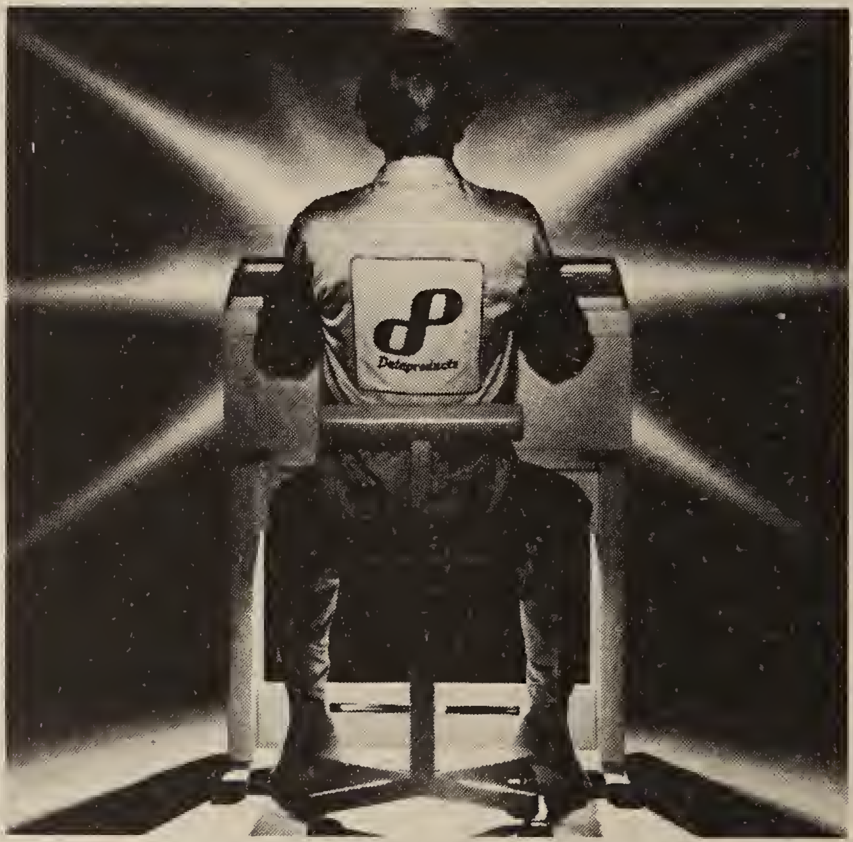

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CA Reduces Prices Of Naked Mini

IRVINE, Calif. — Computer Automation, Inc. has reduced the prices of its Naked Mini processors, memory enhancements and peripherals by as much as 20%.

The largest reductions came in memory prices. Now, 1M byte of error-correcting memory costs $24,000, a reduction of about 20%. Most other memory increments were cut by 15%, the vendor said.

The price of the Naked Mini-4 processor was cut about 8%, making the 4/95 processor with 512K bytes of memory about $16,000. Quad floppy subsystems were cut 18% to $3,950, the vendor said.

Added to the Naked Mini lineup is a 32M-byte Control Data Corp. Phoenix cartridge disk drive. That unit, including controller, costs $11,000. Add-on disks cost $8,100, the vendor said.

The vendor is located at 18651 Von Karman, Irvine, Calif. 92713.

Zilog Adds 16-Bit Micro, Says It Beats PDP-11/70

CUPERTINO, Calif. — Zilog, Inc. has introduced a multiuser 16-bit computer system that utilizes an enhanced version of Bell Laboratories' Unix operating system and is said to be 10% to 30% faster than Digital Equipment Corp.'s PDP-11/70.

In addition, Zilog's microcomputer-based system costs less than $30,000, or about one-third as much as the DEC computer.

The System 8000 incorporates Zilog's Z8000 microprocessor and Zeus operating system, which is said to be similar to Unix, but adapted to fit more into business applications.

These enhancements include a visual editor utility that allows users to display a full page of text on a CRT terminal screen and edit the copy using a minimum number of keystrokes, a spokeswoman said. The operating system changes make the system more applicable to word processing and other text-oriented applications such as general accounting, electronic mail and management information systems reporting.

The System 8000 features a CPU card based on the segmented Z8010A processor and has three on-board memory management units that support segmented or nonsegmented processes. The computer can support up to eight users and up to 1.5M bytes of error-correcting memory implemented in 256K-byte memory array cards.

In addition, up to four 24M-byte 8-in. Winchester disk drives and 17M-byte cartridge tape backup units can be carried by the system's two intelligent Z80B-based controller boards, the spokeswoman explained.

The standard system configuration includes eight serial synchronous/asynchro-

(Continued on Page 62)

Small Business Graphics - Part 2

Research Firm Proves Ideal Candidate

By Tim Scannell
CW Staff

The people who pitch computer graphics at the small business user usually talk in terms of saving time, saving money and making a better impression on your audience.

So it is natural that a small company with a particularly heavy data load would be the ideal candidate for a microcomputer-based graphics system.

Abt Associates, Inc., a research agency based in Cambridge, Mass., is one such company. Founded in 1965, Abt Associates does social science and public policy research that involves compiling information and charts and making up reports for the government.

Abt Associates is reportedly the largest such organization in the country; its revenues last year totaled about $30 million.

The company has about a dozen Apple Computer, Inc. microcomputers, nearly half of which are loaded with Personal Software, Inc.'s Visiplot and Visitrend plotting software.

While the firm uses the computers' graphics capabilities to do some external work, most of the Apples' time is spent preparing internal reports, plotting planning data and drawing up charts to show the results of past projects, Frank Smith, Abt Associates vice-president, said.

This is the second half of a two-part series.

"If I've got a meeting tomorrow and I want to make a point about the growth and sales of our company in 15 years I can use the Apples and do it right there and then."

Because Abt Associates' work for the government often involves taking huge amounts of census and research data and drawing up extensive demographic charts, the Apple computers — because of a microprocessor's inherent limitations — are not used extensively for outside projects.

To accomplish large graphics chores, the firm relies on Abt Computer Graphics Corp., a sister organization formed about a year ago that uses large-scale minicomputers, like the Prime Computer, Inc. Model 750, to run extensive graphics software.

This second company, which is an entirely separate subsidiary of the first, will soon begin marketing a line of turnkey software systems and graphics software, Smith said.

"To some extent, we are distant competitors of Visiplot," he added, noting that the subsidiary's Abtgraph package, which runs only on mainframes, could be considered the "granddaddy" of the micro-based package.

The major benefits of micro-based graphics software in general is that it can be self-taught and used by even the most computer-unsophisticated business person, Smith explained.

Computer Graphics Has Its Share of Problems

Although computer graphics is relatively new to small business — with its biggest growth seen just over the horizon — it does have its share of small business problems.

For instance, while microcomputers, software and plotting packages are inexpensive, with a typical system costing about $3,000 or $4,000, getting quality hard copy can be an expensive problem.

And for those users who may use mainframe-based service bureaus to keep their business information, processing that information through a microcomputer and into graphics form is nearly impossible.

A good hard-copy unit can cost a user $1,000 to $2,000 over and above the cost of a microcomputer system, according to Carl Machover, head of Machover Associates Corp. and a noted graphics consultant. And if he wants color, it can run close to $5,000 for a camera

(Continued on Page 62)

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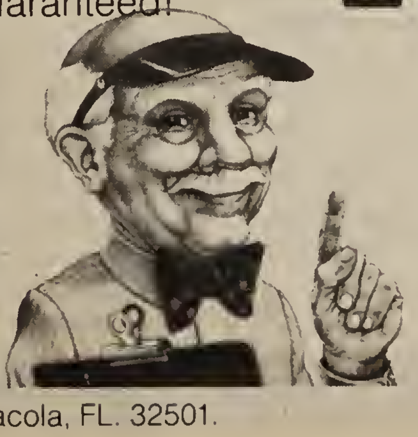

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Zilog Multiuser Micro Runs Under Unix

(Continued from Page 61)

nous communication ports. Additional I/O controllers that support eight serial lines each are optional, she added.

Finally, all of the system's boards plug into the 10-slot backplane of the Z-Bus backplane interconnect, a 32-bit bus with an 8M byte/sec bandwidth that is said to allow for the future implementation of high-speed 32-bit processors and peripheral controllers.

Software languages available with the System 8000 include Cobol, Pascal, C and the firm's PLZ. Fortran, Business Basic and a number of other software enhancements will be offered in 1982, the spokeswoman claimed.

Since the Zeus enhancements do not change the soul of Unix, programs developed on other Unix systems can be transported to the System 8000.

The machine is available in two versions: the Model 20, priced at $29,950, includes the CPU board, two controllers, 256K bytes of memory, one Winchester drive, a cartridge tape drive and eight I/O ports; and the Model 30, at $37,950, which is the same package but with 512K bytes of memory and two 24M-byte drives.

User expansion kits that provide the hardware and software necessary to increase the size of the System 8000 in eight-user increments are priced at $6,950 each.

Zilog is located at 10340 Bubb Road, Cupertino, Calif. 95014.

Business Computer Graphics Grapples With Tough Problems

(Continued from Page 61)

copy unit.

"If the user is willing to accept a black-and-white output and he has any kind of a matrix printer, then a simple screen dump will provide a basic black-and-white copy," Machover added. "The cost of color copy is not particularly high, but higher than the normal personal computer cost."

One roadblock Michael Kapor, president of Micro Finance Systems, Inc., thinks will have to be resolved before graphics is unhesitatingly accepted by the small business sector involves communications. More specifically, communications between the big machines and their little cohorts.

"In a lot of cases, a user's data is up in mainframes. Although they can do graphics on their micro, they may not have a way of getting that data down to it," Kapor stated.

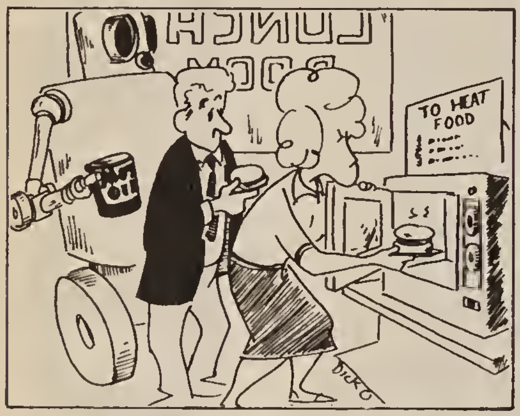
"There is a communications problem which people are addressing now and we're going to see a whole raft of products that will really automate the process," he continued.

Series 3000 Gets More Memory

IRVINE, Calif. — Micro Five Corp. has enhanced its Series 3000 microcomputer-based business system to include up to 512K bytes of main memory.

Memory can be enhanced up to 384K bytes in the standard processor with five I/O ports. In the six-I/O port unit, up to 512K bytes of memory can be added, the vendor said.

Memory capacity is available in 128K-byte increments at $3,000 each. The additional six-port I/O expansion unit costs $4,000. Micro Five systems cost from $18,000, the vendor said from 17791 Sky Park Circle, Irvine, Calif. 92714.



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You won't find RAM memory anywhere priced as low as $6K a megabyte...especially *intelligent* RAM memory. Intel's advanced iSBC 86/12™ single-board computer equips the FAST-3815 with unparalleled intelligence that, among other functions, handles channel protocol and performs sophisticated self-healing diagnostics.

Self-healing procedures which make the FAST-3815 virtually fail-safe include:

- The first commercial application of 'hot' spares and double-bit error correction with multiple-bit detection,

Turnkey System Processes Election Results

SANTA ANA, Calif. — Elections International, Inc. has announced a turnkey system that processes election results.

The system reportedly cuts the time necessary to process election results by at least 1½ hours and cuts the potential for error, the vendor claimed.

Systems are based on available hardware. However, the system is compatible with Data General Corp. Nova processors, according to the vendor.

Systems cost between $100,000 and $500,000, the vendor said from 1450 Tustin Ave., Santa Ana, Calif. 92701.

Disk Drive Out For Chieftain

WESTLAKE VILLAGE, Calif. — Smoke Signal Broadcasting has announced a 30M-byte 8-in. Winchester-type disk drive for its Chieftain Series of computer systems.

The 98W30 is configured around a Motorola, Inc. 6809 microprocessor and uses standard backup of a 1M-byte 8-in. double-sided floppy disk, the vendor said.

The unit runs on the OS-9 operating system and features 32K bytes of random-access memory that is expandable up to 1M bytes, according to the vendor.

A system configured with the 30M-byte disk drive costs $9,995, the vendor said from 31336 Via Colinas, Westlake Village, Calif. 91361.

Magnetic Tape Subsystem Handles IBM-Format Tapes

TARZANA, Calif. — Ibex Computer Corp. has announced a magnetic tape subsystem that is compatible with IBM-format tapes and comes with a standard RS-232 serial interface.

Designed for use with minicomputers and microcomputers, it is compatible with all operating systems and is controlled by the host processor through the transfer of the appropriate Ascii codes over the RS-232 or current loop interface, the vendor said.

The subsystem uses a dual-density, 9-track, 12.5 in./sec tape drive for either 800 char./in. or 1,600 char./in. with more than 40M bytes of storage on a 10½-in. reel, the vendor said.

Control codes are transparent to data and transmission rates are switch-selectable from 110- to 19.2K bit/sec. The unit is based on the Z-80 processor that provides space for a 4K-byte random-access memory buffer or an optional 8K-byte buffer. Record lengths of 4K- or 8K bytes can be written on the magnetic tape, the vendor said.

Tape subsystems cost between $8,100 and $10,000, the vendor said from 5416 Noble Ave., Van Nuys, Calif. 91411.

Atari 800 Gets Memory Program

SUNNYVALE, Calif. — Axlon, Inc. has introduced a 128K-byte memory software program called Ramdisk for the Atari, Inc. 800 personal computer.

Ramdisk comes with software that makes the 800 function like a disk device. It can also be programmed as bank-selectable random-access memory (RAM), Axlon said.

The Ramdisk Memory System, when utilized as an additional disk device in conjunction with an Atari 810 disk drive, is said to be compatible with existing software written for the Atari 800 system. Ramdisk can also be utilized as bank-selectable RAM.

The first memory product for the personal computer market using 64K-byte RAM chips, according to the firm, Ramdisk includes the 128K-byte Ramdisk module, operating manual, DOS memory management software and utility software. Ramdisk is available at Atari dealerships nationwide for $699. Axlon is headquartered at 170 N. Wolfe Road, Sunnyvale, Calif. 94086.

Controller Available For Seagate Disks

SUNNYVALE, Calif. — Xebec Co. has announced a controller for Seagate 5¼-in. disk drives. The S1410 uses multisource gate array technology and is compatible with Shugart Associates, Inc. SA 1400 series host interface, the vendor said.

The unit combines a microprocessor-based controller with on-board data separator logic. It is capable of controlling two drives simultaneously, the vendor said.

The S1410 costs $295, the vendor said from 432 Lakeside Drive, Sunnyvale, Calif. 94086.

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Turnkey System Aids Mortgage Documentation

DALLAS — Symbolics Financial Sytems, Inc. has announced an entry-level turnkey system for mortgage loan documentation applications.

The system is based on an IBM Series/1 processor and uses the document preparation modules of the firm's Mortgage Loan Control System, the vendor said.

Systems cost approximately $50,000, the vendor said from 4580 Beltway Drive W., Dallas, Texas 75234.

Phoenix-Type Disks Get Disk Cartridge Cleaner

TARZANA, Calif. — Innovative Computer Products, Inc. has announced the Model 300 disk cartridge cleaner for Phoenix-type disk cartridges.

Called the Model 300-PX, the unit uses a proprietary cleaning solution along with disposable cleaning pads, the vendor said.

The cleaner costs $1,300, the vendor said from 18360 Oxnard St., Tarzana, Calif. 91356.

Floppy System Unveiled For LSI-11 Microcomputers

GARRISON, N.Y. — Cyberchron Corp. has unveiled the CFD-211 double-density floppy disk subsystem for the Digital Equipment Corp. LSI-11/03 and LSI-11/23 microcomputers.

The CFD-211 features hardware, software and media compatibility with DEC RX02. An automatic bootstrap is jumper-selectable, eliminating the need for a separate read-only memory bootstrap, the firm said.

The interface and formatter is packaged on a single dual-height card and extended direct memory access addressing to 128K words is standard.

The CFD-211 costs $3,495 for a 1M-byte unit. The vendor can be reached at P.O. Box 164, Manitou Road, Garrison, N.Y. 10524.

Parallel Printer Offers English/French Char. Sets

MOUNTAIN VIEW, Calif. — Cromemco, Inc. has announced a microprocessor-controlled parallel printer designed for use with its own systems.

The 3715 prints 9-in. by 7-in. dot matrix characters at 150 char./sec and can print character sets for both English and French, the vendor said.

The 3715 parallel printer is priced at $1,295 from Cromemco, Inc., 280 Bernardo Ave., Mountain View, Calif. 94043.

Webster's Buyer's Guide For Micros Now Available

LOS ANGELES — Webster's *Microcomputer Buyer's Guide*, which reviews more than 150 microcomputer systems from more than 150 major microcomputer suppliers including some Japanese vendors, is now available.

The guide was designed for both the first-time and experienced computer user in choosing a single-board microcomputer or microcomputer system to suit the user's application. Other topics discussed are microcomputer theory, applications, independent software vendors and a range of display and printing terminals.

The guide costs $25 plus $2 postage and handling from Computer Reference Guide, 135 S. Harper Ave., Los Angeles, Calif. 90048.

Dual Disk System, Kits Fit TRS-80 Model III

SANTA ANA, Calif. — Microcomputer Technology, Inc. has announced a dual disk system and a line of disk kits for Radio Shack TRS-80 Model III microcomputers.

On the Model III line of disk products, the firm said, its basic 16K-byte unit has been expanded to offer 48K bytes. In addition, double-density versions of the drives are also available.

The disk system is said to be fully compatible with Radio Shack's DOS operating system and peripherals and costs $1,998.

In addition, the firm offers disk upgrade kits for TRS-80 users. The 40-track kits are available as internal or external drive units and are priced from $359, the vendor said from 3304 W. MacArthur Blvd., Santa Ana, Calif. 92704.

Impact Printer VII Offers Dot-Addressable Graphics

FORT WORTH, Texas — Radio Shack Corp. has announced a line printer that offers impact printing and dot-addressable graphics features.

Called the Printer VII, the unit prints either 40 or 80 uppercase and lowercase characters per 8-in. line at 30 char./sec. In addition, the dot-addressable graphics capability prints at 3,780 dot/sq in., the vendor said.

The unit is compatible with the firm's TRS-80 line of personal computer systems and costs $399, the vendor said from 1800 One Tandy Center, Fort Worth, Texas, 76102.

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BDS Printer for PE Minis Runs 300- to 1,500 Line/Min

MENLO PARK, Calif. — A printer for Perkin-Elmer Corp. Model 16/32 family of minicomputers that provides printing speeds from 300 line/min to 1,500 line/min is being offered by BDS Computer Corp.

The NPC-20 controller and printer are easy to install and no software or hardware modifications are required, BDS said.

Contained on a 7-in. by 15-in. board, the controller accepts 7-bit Ascii data, buffers and transfers it to the printer via high-speed Schottky logic. Hexadecimal switches on the card permit address selection. The NPC-20 interfaces directly with BDS' band printers with speeds of 300-, 600-, 900-, 1,200- and 1,500 line/min. Standard bands have 64- or 96-char. sets with special or foreign language bands available as options.

The NPC-20 costs $6,250 to $28,850 depending on printer speed. BDS is located at 1120 Crane St., Menlo Park, Calif. 94025.

DTC 1400s Back Four Disk Drives

SANTA CLARA, Calif. — Data Technology Corp. has announced the 1400 series of controllers that support up to four 8- or 14-in. Winchester-type disk drives along with Data Electronics Corp. Streaker or Archive Sidewinder cartridge drives.

The DTC-1406 controller reportedly handles up to four 8-in. Winchester drives using an SA1000-type interface and one Streaker tape drive. The DTC-1408 supports systems using Sidewinder tape cartridge drives. The DTC-1407 supports up to four 14-in. Winchester drives and one Streaker tape drive. The DTC-1409 supports the Sidewinder tape unit.

Units are priced from $1,200, the vendor said from 2344A Walsh Ave. Santa Clara, Calif. 95051.

Single-Board Disk Controller Emulates DEC RM02/03/05

SUNNYVALE, Calif. — System Industries, Inc. has announced a single-board disk controller for Digital Equipment Corp. PDP-11 Unibus processors.

Called the Model RMOX/6100, the controller plugs into the standard peripheral interface slot on a PDP-11 processor. The unit offers emulation to the Digital Equipment Corp. RM02/03/05 controller and it is software transparent to all DEC operating systems, the vendor said.

The unit has bipolar microprocessor design and operates with a variety of industry-standard storage module drives including the firm's 8M- and 300M-byte versions as well as its 160M- and 675M-byte Winchester drives, the vendor said.

A 160M-byte Winchester system with the RMOX/6100 controller costs about $10,000, the vendor said from 525 Oakmead Parkway, P.O. Box 9025, Sunnyvale Calif. 94086.

FT-68M Unit Fits Multibus

SANTA CLARA, Calif. — Forward Technology, Inc. is offering the third member of its Gateway series of Multibus-compatible single-board computers (SBC), the FT-68M.

The unit was designed around the Motorola, Inc. 32-bit, MC68000. Contained on a Multibus-compatible circuit board is the 68000 chip, 256K bytes of random-access memory including error detection, memory management and protection, serial and parallel communications facilities and five counter/timers.

The FT-68M was designed to assist system designers who need the power and flexibility of the 68000 combined with 256K bytes on one Multibus-compatible board, the vendor said. The unit features a 32-bit architecture, 16 32-bit registers, three major data sizes and flexible addressing modes. Two user-programmable RS-232C interfaces are provided and the serial interfaces will reportedly operate in either synchronous or asynchronous mode.

The FT-68M costs $3,495 from the firm whose new headquarters is at 2595 Martin Ave., Santa Clara, Calif. 95050.

TRS-80 Interfaced To Card Readers

CHATSWORTH, Calif. — Chatsworth Corp. has unveiled an interface to the Radio Shack TRS-80 Model III for its MR 500 and OMR 500 card readers.

Said to offer "an affordable alternative" to keyboard entry, the interface plugs into the I/O bus jack of the Model III. The card data can be in two formats: the Ascii equivalent code or the image of the data.

The MR 500 can only read a soft pencil mark while the OMR 500 is an optical reader that not only reads marks made by writing implements, but can also scan cards containing punches and preprinted and mark-sense data.

The MR 500, including interface and driver, costs $750. The OMR 500 costs $1,095. Both have 30-day delivery from the firm at 20710 Lassen St., Chatsworth, Calif. 91311.

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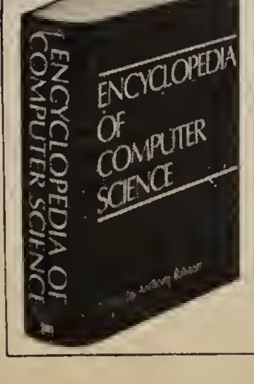

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Foundation Makes Switch to System For Easier Access To Grant Records

NEW YORK — With assets in the area of $88 million, the William T. Grant Foundation disburses approximately $3 million to $4 million a year, principally to universities and research institutions. Administering these disbursements involves a great deal of paperwork — all of which was processed manually until quite recently.

"It was a fairly good manual system," attested E. Jeanne Merkling, vice-president and corporate secretary at the foundation, and a 19-year veteran. "We could trace our grants back to 1936. As you can imagine, there was a lot of paper to wade through.

"The real problem was that I was limited to accessing the grant records by only one parameter — the grantee institution. There was no way to review the records and easily determine how many research projects we funded in any particular area. I would either have to rely on my memory or go through every one of the annual reports to select the particular projects and pull the individual files.

"Once, in fact, we did a nine-year survey, using three-by-five cards. And we learned that the tediousness of manual processing leads to the danger of continually changing your criteria for selection and classification," Merkling said.

Consultant Recommendation

A consultant recommended acquiring an integrated information system combining word processing and data processing functions. After comparing two systems, the foundation decided on a system from Wang Laboratories, Inc.

In June 1980, the foundation acquired a Wang 2200 MVP small business system with 256K bytes of memory and a 30M-byte disk drive. The foundation started with three workstations, a 200 char./sec matrix printer for drafts and a daisy printer for letter-quality copy.

It has since added storage to the disk drive for a total of more than 80M bytes and increased the number of workstations to eight. A third character printer is on order.

The software, called the Grants Investment Financial Trust System (Gifts), was provided by IFA Systems, an independent software company.

With Merkling's input, a systems analysis was performed to examine all manual tasks for possible electronic applications. "It was a unique experience," Merkling said. "Not knowing a thing about computers, I could only express the goals I was looking to achieve."

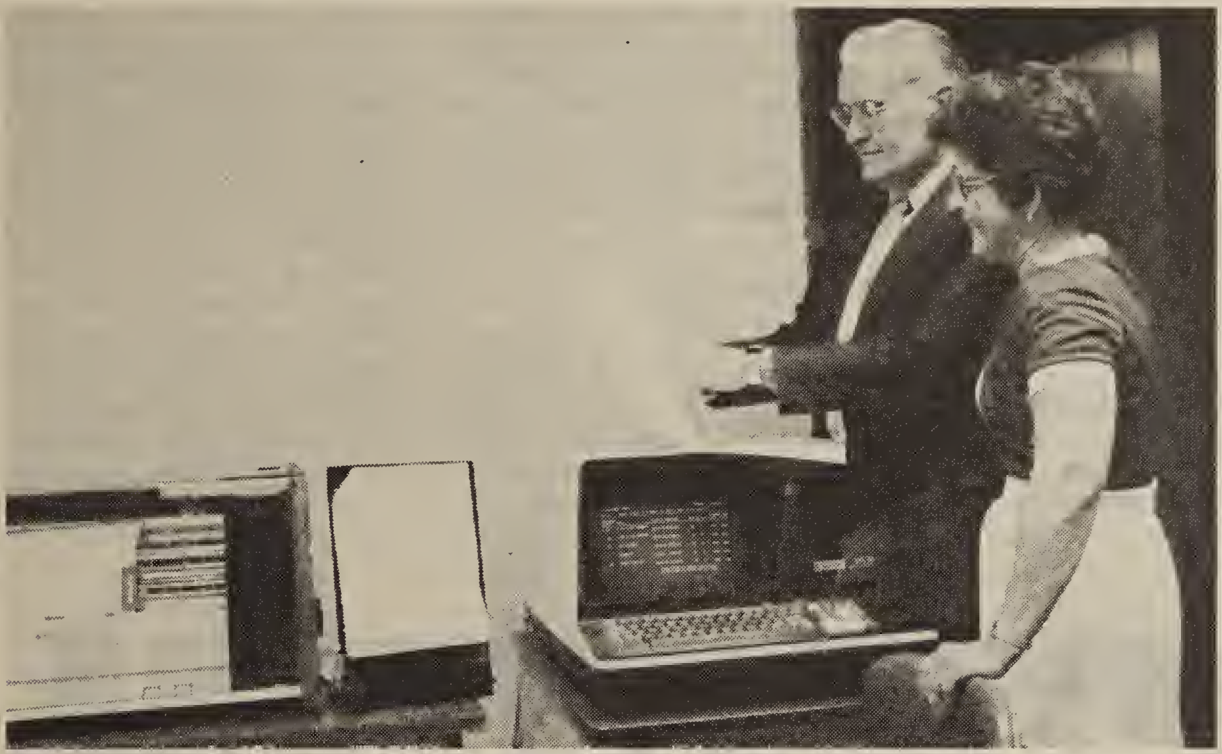
First and Foremost

First and foremost, the foundation began keying in the most current paperwork for processing, but the overall goal was to establish an electronic data base of all the records back to 1936. The foundation's automated system provides grants management, from the processing of applications through refusal or acceptance; internal and project budgeting and budget forecasting; publication tracking; portfolio tracking; and the automatic payment of grants. A word processing interface allows for the generation of customized letters and reports.

"I have yet to tap all of the analyses and reports the system can generate," Merkling said. "The records of the foundation are rich with historical import, and the

(Continued on Page 68)

Report Prepared via WP Put Smile on Realtor's Face



Wikoff checks report produced by micro-based WS78 system.

MISOULA, Mont. — Charles Wikoff is smiling. He's smiling because automation is enabling him to spend more time evaluating investment possibilities and less time preparing reports.

As a result, his clients at Wikoff Realty are receiving more extensive financial documents including detailed portfolios, cash flow tables, rate of return schedules, tax situation analysis and other vital investment reports. Previously, these reports were prepared manually, involving lots of paperwork, long hours and comparatively small returns. Because paperwork was taking its toll, Wikoff decided to automate his report preparation.

Through Alpha Omega, Inc., the authorized Digital Equipment Corp. distributor in Missoula, Wikoff ordered DEC's microcomputer-based WS78 word processing system with 32K bytes of memory, a WT78 video terminal and dual RX02 floppy disks, each with 512K bytes of storage. Rounding out the system is a LQP78 letter-quality printer for document production. Alpha Omega installed the Real-Estate software package and a freelance programmer developed custom accounting and financial programs.

Wikoff Realty devotes itself almost exclusively to commercial properties such as office complexes, shopping centers, mobile home parks and industrial buildings. The agency has around 35 clients, all of them repetitive.

Fitting Needs

When a client is interested in purchasing a property, it is up to Wikoff to locate the property that is best suited to that client's needs and financial requirements.

"Before we installed our system, running down all the information needed to take a client through a purchase or a sale was tedious," Wikoff explained. "I had to figure the best move for him to make financially, then decide what he needed for tax purposes, the kind of terms we should go after, the amount of the down payment, everything. That involved going through the customer's entire file and doing all the calculations on paper. Then, of course, there was the matter of locating the prop-

(Continued on Page 68)

Multinode Version Of 'Comet' Posted

CAMBRIDGE, Mass. — Computer Corp. of America has introduced Multi-Comet, a multinode enhancement of its Comet electronic mail system.

Comet runs on IBM 370 or Digital Equipment Corp. PDP-11 computers. Multi-Comet uses DEC's Decnet network protocol allowing communications between users associated with different nodes or PDP-11 computers. It provides a means to expand any in-house Comet system by adding another CPU node and provides for private in-house Comet systems to interconnect to the general public Comet service.

Software requirements include the RSX-11M-Plus operating system, the Decnet protocol. Hardware requirements include a PDP-11 computer capable of supporting Comet and sufficent memory for Comet and Decnet hardware and the hardware that links various Decnet devices.

Multi-Comet costs $5,000 from Computer Corp. of America, 675 Massachusetts Ave., Cambridge, Mass. 02139.

Datapoint Offers Letter Printer

SAN ANTONIO, Texas — A 30 char./sec letter-quality printer is being offered by Datapoint Corp. to function with the firm's integrated office products and services.

The Model 9611 features microprocessor control. Designed with small businesses and branch offices in mind, the printer, when connected to any Datapoint processor with a serial interface, can be used as a local printer in either a stand-alone configuration or as part of the vendor's Attached Resource Computer system.

It can also serve as a terminal printer when connected to a Datapoint 8200.

The Model 9611 prints bidirectionally at a speed of 30 char./sec. Line width and spacing, form length and print pitch can be user-specificied.

The Model 9611 costs $3,990. Installation is an additional $165. Monthly lease prices are $149 for one year, $133 for two years and $122 for three years.

Maintenance costs $32/mo, the vendor said from 9725 Datapoint Drive, San Antonio, Texas 78284.

Realty Gains Research Time Via Automation

(Continued from Page 67)

erty that best met his needs."

Installing the DEC WS78 with the new software package changed all that because all client records and programs are on floppy disks. The programs include cash flow analysis, exchange basis, an exchange worksheet, portfolio analysis, individual tax analysis, an internal rate of return, a financial management rate of return and amortization schedules.

The programs and the forms associated with them may be viewed on the terminal at any time. Initially, Wikoff enters all pertinent data regarding the client: name, address, income tax situation, properties owned and other factors. Information can be deleted, added, moved or duplicated through the use of special keys adjacent to the main keyboard.

Information common to a number of documents, such as name and address, need only be entered once; the WS78 programs automatically insert the information in the correct location on all other records. Similarly, data is appended to all pertinent files as it is keyed.

Routine Analysis

Wikoff routinely reviews and analyzes client investments. In the portfolio analysis program, for example, every property is detailed: its description, when it was purchased, amount of purchase, payments remaining and the amount of income it earns the client. A complete examination, which once took several hours, now can be accomplished in about 20 minutes.

The system also makes all calculations. "A cash flow analysis used to take 45 minutes manually," Wikoff noted. "With the WS78, I can now do them in about three minutes." The cash flow analysis program is useful for improving a client's financial standing. Resident in the WS78's files, it details the amount of money each client earns from his various holdings, how much he pays out and his cash position. By comparing cash flow analysis with portfolio rate of return and the tax analysis, Wikoff can deduce adjustments necessary for his clients' portfolios.

"A complete amortization schedule can be prepared and printed in about five minutes.

"We also used to estimate tax brackets," he continued. "Now we enter exact income, dependents, marital status and deductions. The system quickly calculates the person's tax liability so we can judge the impact of a particular investment."

DEC WS78 system has not only expanded Wikoff Realty's capability, it has also improved the efficiency of the company's office management. When he bought the real estate software package, Wikoff looked ahead to increased business volume and had a program written specifically to help run the company.

Wikoff said the unit has more than paid for itself in the time it has saved him and the opportunities it has opened up.

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Automation Aids File Access

(Continued from Page 67)

foundation is concerned with utilizing all its resources to the best effect. By putting our records onto our Gifts system, we are able to make all kinds of logical groupings and cross checks directly on a workstation screen. We simply designate the parameters and conditions and proceed from there."

Information may be automatically pulled from three fundamental categories: by the grantee institution, the individual name most identified with a project and by the project descriptors (type of project, field of study and particular topic or subject).

Initial Review

Upon receipt of an application, a file is opened on the system and the application is classified according to the nature of the request. A program officer makes an initial review of the incoming material and selects those requests that do not fall within the current program interests. The Wang system generates the appropriate type of rejection letter.

The remaining letters go before Robert J. Haggerty, M.D., the foundation president, who selects those applications that can be given further consideration. In most cases the applications are then sent to outside consultants for evaluation.

Pending positive reviews from the consultants, applications are taken to the program committee, consisting of five members of the board of trustees. Another elimination process is conducted and applications that pass this final review are recommended for consideration by the full board.

Apart from the initial typed rejection letter, some applicants receive letters containing fuller explanation. A consultant's critique may suggest ways to restructure the application. The foundation's automated system easily generates this paperwork.

"There is an unlimited chain of links you can put on the system," Merkling noted. "Consultant reports, consultant resumes, the interests of board members. We are able to classify the consultants as well as the applicants by areas of expertise, research interests and so on."

Leaves Intel Top Supplier

National Semi Bursts Bubble Operation

By Marcia Blumenthal
CW Staff

The withdrawal of National Semiconductor Corp. from the magnetic bubble memory market late last month — the third company to ditch bubble efforts this year — left Intel Magnetics, Inc., now specializing in 128K-byte devices, as the major U.S. supplier of these units.

National Semiconductor's bubble memory sales totaled less than $1 million annually, Charles E. Sporck, the firm's president and chief executive officer, noted. Sporck pointed out that this segment of the memory business is not projected to reach previously forecast estimates.

Texas Instruments, Inc. halted its bubble effort in June, explaining that other technologies have come down the cost/learning curve faster than bubbles [CW, June 8]. Rockwell International, Inc. halted its bubble memory program earlier this year.

Additional Vendors

Besides Intel, Westinghouse Electric Corp. is involved with bubble memories and Motorola Co. has made a commitment to that market, according to Stewart Sando, marketing manager for Intel Magnetics, a subsidiary of Intel Corp. U.S. semiconductor vendors apparently have cooled toward bubble memories, but Japanese vendors are committed to these memory devices, he added.

While bubbles were hailed by some vendors as a replacement for such mass storage devices as disks, Intel never saw the market that way, Sando explained during a recent interview. Instead, Intel concentrated on incorporating its bubble memories into small systems used for applications in harsh environments, such as process control. A critical concern has resided in getting the temperature tolerance of the devices to operate between 0° C and 70° C.

However, now the proliferation of distributed microprocessor-based networks and various point-of-sale terminals is driving the need for nonvolatile, maintenance-free small mass storage devices, Sando noted. Intel's product contains an interface that ties directly to the microprocessor bus.

Supplying an adequate amount of memory for local microprocessor needs is a key to Intel's future small system strategy. Moreover, as systems become more portable, users need systems that are self-contained. Bubble memory units are contained on a single board. Magnetic bubble memory requires no head cleaning or repositioning.

Computer vendors have a blind spot when it comes to bubble memories because the cost per bit of bubble memory is still higher than that of floppy disk or small Winchester disk storage, Sando said. He predicted the cost for 128K bytes of bubble memory will fall below $100 in the near future.

While Intel's largest bubble memory is currently the 128K-byte device, the firm will introduce a 512K-byte device in the not-too-distant future, according to Sando. By 1985 that device will cost about $150.

Intel estimated the bubble market at $50 million this year and anticipates the market will double in both 1982 and 1983, reaching $300 million by that time. Intel claims to hold more than 90% of the 128K-byte bubble market currently, but Sando would not give any estimates of what percentage of the total market this segment comprises.

However, he did say the firm's bookings for this product in the second quarter were 60% higher than in the first quarter.

Two More DG Execs Call It Quits

WESTBORO, Mass. — The exodus of executive brass from Data General Corp. continued late last month as two more vice-presidents resigned.

A DG spokesman said the partings were amicable and expected.

The resignations came from Paul D. Stein, vice-president of manufacturing, and Lawrence Seligman, vice-president and general manager of the Small Business Systems Division.

Stein, who held DG's top manufacturing post for five years, has not made a decision on his next position and will remain at the firm as a consultant for an unspecified period of time, the spokesman said. Replacing Stein is David L. Chapman, who joined DG in July as vice-president of the firm's U.S. manufacturing operations.

Seligman, who was with DG for about 12 years, was made a vice-president in 1979. His successor has not been named. Frank P. Silverman, senior vice-president in the Business Division, will assume Seligman's duties on a temporary basis, DG said.

Seligman said his future plans were uncertain at present, but he was examining opportunities in the office automation or distributed processing markets. He will also continue at DG on a consulting basis for an unspecified period of time.

Maker of Ada Compiler Took New Tack

By Robert Batt
CW West Coast Bureau

SAN DIEGO — New computer companies make their way in the world by latching on to one corner of a fast growing market and milking it for all it is worth. So when a start-up enterprise shuns that approach in favor of creating an entirely new market, technology pundits are inclined to sit up and take notice.

One company that is attracting such attention right now is Telesoft, Inc., which recently announced what it claimed is the first commercially available portable compiler for Ada, the controversial programming language developed for the Department of Defense (see Page 45).

"One of the key objectives in the design of Ada was to establish the basis for a new software components industry," Ken Bowles, chairman of Telesoft, said in an interview here. "Our business objective is to become one of the principal publishers into the software components marketplace and we intend to help create this market for industry at large."

Bowles, best known in the computer industry as the founder and director of the project that created UCSD Pascal, said the Ada compiler is a key component of a family of software tools called the Telesoft Programming Support Environment (Telesoft-PSE). The family also includes a Pascal multitasking compiler, an ROS multitasking operating system and an MC 68000 macro assembler. These, the company claimed, are among the first of a series of software tools it intends to publish.

The Telesoft-Ada compiler is only a partial implementation of the full Ada language since a full standard has yet to be released. It was initially designed to run on desktop microcomputers.

Coming Implementations

"Our aim is to get a compiler in people's hands so that they can check out Ada, and initially we have concentrated on portability," Peter Dine, company president, said. "However, we are committed to continued development of the compiler over the next 12 months and will make further releases as the full Ada standard comes into being."

The next implementations will be for Intel Corp. APX86, Digital Equipment Corp. VAX-11 and IBM 370 systems, Telesoft said. Its PSE tools were designed in particular for systems integrators that are developing other programs, with large organizations being the focus of the initial marketing attack. The company believes it is in a strong strategic position to reap the benefits.

"We are seeing a fundamental inversion in the way the market is looking at acquiring systems from vendors. In the past users were oriented to look at specific lines of hardware with software regarded as having added value. We predict a major market shift to the point where people will focus on the software system with hardware being looked on as added value," Bowles said.

He argued software tools for Ada were vital because users will expect their software to run on all their mainframes irrespective of the vendor. "The advantage of Ada is that it is intended to be used for machines of all sizes," he added.

Although Ada has been until now a hobby horse of the Defense Department, Telesoft is convinced it has wide commercial applications and Bowles estimated that around half its customers would be nondefense contractors. Among those showing interest in the new compiler, he said, were electronics companies, robotic manufacturers and earth station specialists.

"The central issue is the productivity of large programmer departments. We think we are on to a real winner because the potential market for software components tools is immense. The significance of what we are doing is that we are among the first group of people who have consciously gone out to develop new technology to solve the human resource and engineering program from an engineering perspective," Dine added.

"By bringing the state of the art into commercial use we are creating a market for software components," he said.

Telesoft said its strategy can help overcome the shortage of programmers by creating a marketplace for off-the-shelf software components that could be interchanged so that anyone designing a program could put one together using such components.

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Executive Corner

- William Chalmers has recently been named president of Ohio Scientific, Inc.
- Frank J. Chiaverini has been appointed president of Alternatives In Magnetics, Inc.
- Sherry Keowen has been named vice-president of administration at Vector General, Inc.
- Kenneth W. Gross has been elected vice-president of marketing of RCA Global Communications, Inc.
- Jack Eastwick was named vice-president, personnel, for Microdata Corp.
- Jim D. Davis has been appointed vice-president of marketing for Capro, Inc.
- Jerry O. Williams has been elected a senior vice-president at AM International, Inc.
- Trilog, Inc. has appointed Raymond B. Smith vice-president of marketing.
- Digital Datacom, Inc. has named James Mariner vice-president of sales, and Sherwood A. King national sales manager.
- Eddie L. Ketterman has joined Performance Software, Inc. as vice-president of sales.
- William Combs has been named vice-president of marketing operations at GTE Telenet Communications Corp.
- David L. Hinshaw has been named vice-president of engineering development at Stromberg-Carlson Corp.
- Frank Richardson has joined Wicat Systems, Inc. as vice-president, marketing.
- Paul E. Graf has been named to the newly created post of executive vice-president and chief operating officer at Conrac Corp.
- M/A-COM, Inc. has appointed Harry Van Trees senior vice-president.
- Thomas F. Blaylock has been promoted to corporate vice-president of engineering at Data Card Corp.
- Information Displays, Inc. has promoted Michael D. Sohn to vice-president of sales and marketing.
- David Lee has been appointed president of Qume Corp.
- Bruce T. Coleman has been named executive vice-president of operations and Richard C. Lemons has been named a senior vice-president at Informatics, Inc.
- Bill J. Turner has been appointed vice-president of manufacturing operations at Docutel Corp.
- Pete Papiro has joined Britton-Lee, Inc. as vice-president of marketing.
- Robert J. Sywolski has been appointed senior vice-president and a member of the board of directors at CGA Computer Associates, Inc.
- National Data Corp. has appointed Edward J. Gainer as vice-president of product management and consulting in the Cash Management Services Division.
- James Peck Scheer has been appointed vice-president of marketing at Information Retrieval Systems Corp.
- Douglas R. Kraul has joined Printacolor Corp. as head of the engineering staff.
- Robert L. Faulkner has been promoted to vice-president of engineering in the Basic Four Information Systems Division at Management Assistance, Inc.
- Robert Wyatt has been promoted to vice-president of New England operations for the Information Services Division at Keane, Inc.
- Priam Corp. has appointed Joseph B. Smith as vice-president of manufacturing operations.
- Richard Hannes has been appointed vice-president of business development for Informatics, Inc.
- George H. Lerner has joined Terminal Sales & Development, Inc. as vice-president of marketing.
- Terrance J. Bruggeman has been elected vice-president of finance and administration at AM International.

New Companies

Western Business Computers, Inc. has formed **Turn-Key Business Systems, Inc.** to distribute customized small business computer systems in the San Francisco Bay area. The company is located at Suite 272, 2025 Gateway Place, San Jose, Calif. 95110.

Capro Corp. has been formed to market computer systems based on a new software technology called Pro, which reportedly eliminates the need for human programmers in business systems applications. The firm is located at 2691 Richter Ave., Building 124, Irvine, Calif. 92714.

Innovative Service Corp. provides in-field emergency service and regular preventive maintenance of rigid disk media for users of medium-to-large computer systems. The company is located at 364 Alric Court, San Jose, Calif. 95123.

DMA Systems Corp. has been formed to design, manufacture and sell high-performance auxiliary storage devices to the original equipment manufacture segment of the information processing industry. The company is located at 325 Chapala St., Santa Barbara, Calif. 93101.

Calcomp Restructures Internal Organization

ANAHEIM, Calif. — California Computer Products, Inc. has restuctured its internal organization by expanding the office of the president, strengthening its group staff and restructuring its Graphics Products Division into three product divisions

H. Eugene Brewer, former vice-president and general manager of the graphics products division, has been named vice-president of operations in the president's office.

The three new product divisions — Plotter Products, Digitizer Products and Display Products — along with the existing systems division will be responsible for planning, product marketing, development and manufacturing quality.

Calilfornia Computer Products, Inc., a subsidiary of Sanders Association, Inc., is located at 2411 W. La Palma Ave., Anaheim, Calif. 92801.

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c. Provides powerful range selection when running a report.
d. Allows the User to access data files residing on any device.
Check appropriate box.
☐ a. ☐ b. ☐ c. ☐ d. ☐ e. All of the above.
☐ f. All of the above and more.

TRUE OR FALSE

T. F. The Key Name of the Field is very important to the User because it allows the Report Writer to find data associated with the same Key Name in other files.
T. F. Report Writer allows up to 18 decimal positions.
T. F. With Report Writer the User has the choice (at run time) of the following output devices: Printer #1, Printer #2, Printer #3, Terminal Screen.
T. F. With Report Writer a Reference Manual is provided with an appendix containing examples that step the User through a report from start to finish.
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Orders & Installations

The Tennessee Department of Health has signed a five-year contract, estimated at $20 million, with Computer Sciences Corp. for processing Medicaid claims.

National Data Communications, Inc. has received a contract for its integrated on-line/real-time patient information systems from Washoe Medical Center in Reno, Nevada.

The Sweeney Computing Corp. has installed its DRS/Order Entry Systems at Medline Industries in Northbrook, Ill. Applications installed include teleprinter order entry, teleprinter order acknowledgement and touch tone/voice order entry.

The Sisters of Saint Mary Data Center in St. Louis, Mo., has ordered a large-scale Sperry Univac 1100/82 multiprocessor valued at approximately $2.3 million.

Demotyme Corp. of Dallas has purchased three Honeywell DPS 6/54 small computers in the first step in building its distributed data processing network that will be the basis of its activities.

Paradyne Corp. is instituting an electronic message delivery system for its 20 customer service offices throughout the U.S., through General Electric Information Services Co. The system they are installing is the GE Quick-Comm system.

Visa U.S.A., Inc. has announced plans to invest up to $10 million in the installation of new IBM Series/1 computers at member locations that are designed to support wide dissemination of point-of-sale terminals and also help to reduce fraud and credit losses.

Compugraphic Corp. erroneously listed the American Petroleum Institute as having ordered four large Quadex Composition Systems. The four systems were in fact ordered by a different firm not associated in any way with the Institute. Compugraphic Corp. has apologized to the Institute for the confusion caused by the mistaken reference.

Distributed Systems Corp. has been awarded a contract by P&C Food Markets, Inc. for the development of an advanced computerized warehouse management system.

Systems Engineering Laboratories, Inc. has completed installation of a 32/7780 computer at Computer Aided Manufacturing-International, Inc.'s facility in Arlington, Texas.

Foreign Orders & Installations

The Perkin-Elmer Corp. has been awarded a major contract by Compagnie Generale de Geophysique, headquartered in Massey, France, to provide a quantity of the firm's Model 3230 32-bit superminicomputers.

British Petroleum Co. has signed a contract valued at more than $200,000 over the next year for 10 FCS-EPS financial planning systems from EPS, Inc., Evaluation and Planning Systems of London.

Modular Computer Systems, Inc. has announced that Lecontrol Limited of Widness, Cheshire, England, has purchased a Modcomp Classic 7810 computer valued at approximately $40,000.

Scientific Atlanta, Inc. has received an order from Sait Electronics of Brussels, Belgium, for 60 Marisat shipboard terminals to be sold and installed by the Sait Marine International Division.

NCR Purchases Convergent Office Line

DAYTON, Ohio — NCR Corp. has purchased a complete line of "office workstations" from Convergent Technologies, Inc., of Santa Clara, Calif., in a move that poises it to enter the office systems market. Terms of the order were not disclosed.

The workstations are word processors that also can communicate with other computers. Initial delivery is scheduled for next year, the vendor said.

NCR's new office systems division was created in February of this year. The division currently employs approximately 40 people and is headed by Robert C. James.

Trade Surplus Tops $3.5 Billion

WASHINGTON, D.C. — The U.S. trade surplus in computers and business equipment exceeded $3.5 billion in the first six months of this year, according to Census Bureau data compiled by the Computer and Business Equipment Manufacturers Association (Cbema).

The figures indicate that 1981 will see exports exceeding imports by $7 billion, an increase of $1 billion more than the previous year.

Exports of computers were $451 million while imports reached $63.2 million, bringing the total figure for the first six months of 1981 to $312 million.

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Mergers in Hardware, Office Fields Down 9%

CHICAGO — Merger announcements in the office equipment and computer hardware field in the first six months of 1981 totaled 10, a 9% decline from the 11% reported in the same period last year, according to W.T. Grimm & Co.

Of the five office equipment-computer hardware transactions on which price information was available, one was for cash, three for stock and one for a combination of cash, stock and debt, the company said.

Further information on merger activity is available from W.T. Grimm & Co., 135 S. LaSalle St., Chicago, Ill. 60603.

Mergers & Acquisitions

Informatics, Inc. has acquired **Automated Systems Design Corp.** for an undisclosed cash amount.

Datametrics Corp. has signed a letter of intent to purchase the assets of **Micro Business Applications** in a stock-for-assets transaction.

Paradyne Corp. has signed a letter of intent to acquire **Solid State Circuits, Inc.** for 95,000 shares of its common stock.

The signing of a definitive agreement for the acquisition of **Insurance Systems of America** by **United Telecommunications, Inc.** was announced jointly by both chairman of the respective companies.

Supershorts

Cromenco, Inc. has made plans to open a wholly owned European subsidiary called Cromenco A/S in October. The new subsidiary will be located in Copenhagen, Denmark, and will provide technical assistance and support to Cromenco's network of European dealers and distributors.

— — —

ITT Courier Terminal Systems, Inc. has completed fabrication on its 200,000th display terminal.

— — —

A new systems technology division has been established by Computervision Corp. to conduct research and development of its basic systems products.

— — —

Phoenix Automation, Inc. of Ottawa, Canada, has created a subsidiary company in the Boston area called Phoenix Automation, Inc.

— — —

Tominy, Inc. has formed a division to provide services to other companies to held them develop and write professional systems documentation.

— — —

University Computing Co. has formed a new software group and has named J. Allen Hufft senior vice-president of that outfit and head of software marketing worldwide.

— — —

STSC, Inc. has created a new sales division to sell financial management application products and application development systems based on the APL programming language.

— — —

High Technology Wholesale, Inc. said it is marking its fifth anniversary in October as the oldest microcomputer distributor in the country.

— — —

Tominy, Inc. has formed a division to provide services to other companies to help them develop and write professional systems documentation. Daniel K. Bertotti has been appointed manager of the new Documentation Development Services Division.

— — —

The Everett I. Brown Co. has established a Process Engineering Division to provide computer graphics design services nationally for chemical, petrochemical and industrial clients.

— — —

By unanimous approval of its shareholders, International Mathematical & Statistics Libraries, Inc. has changed its name to IMSL, Inc.

Computer and Systems Professionals

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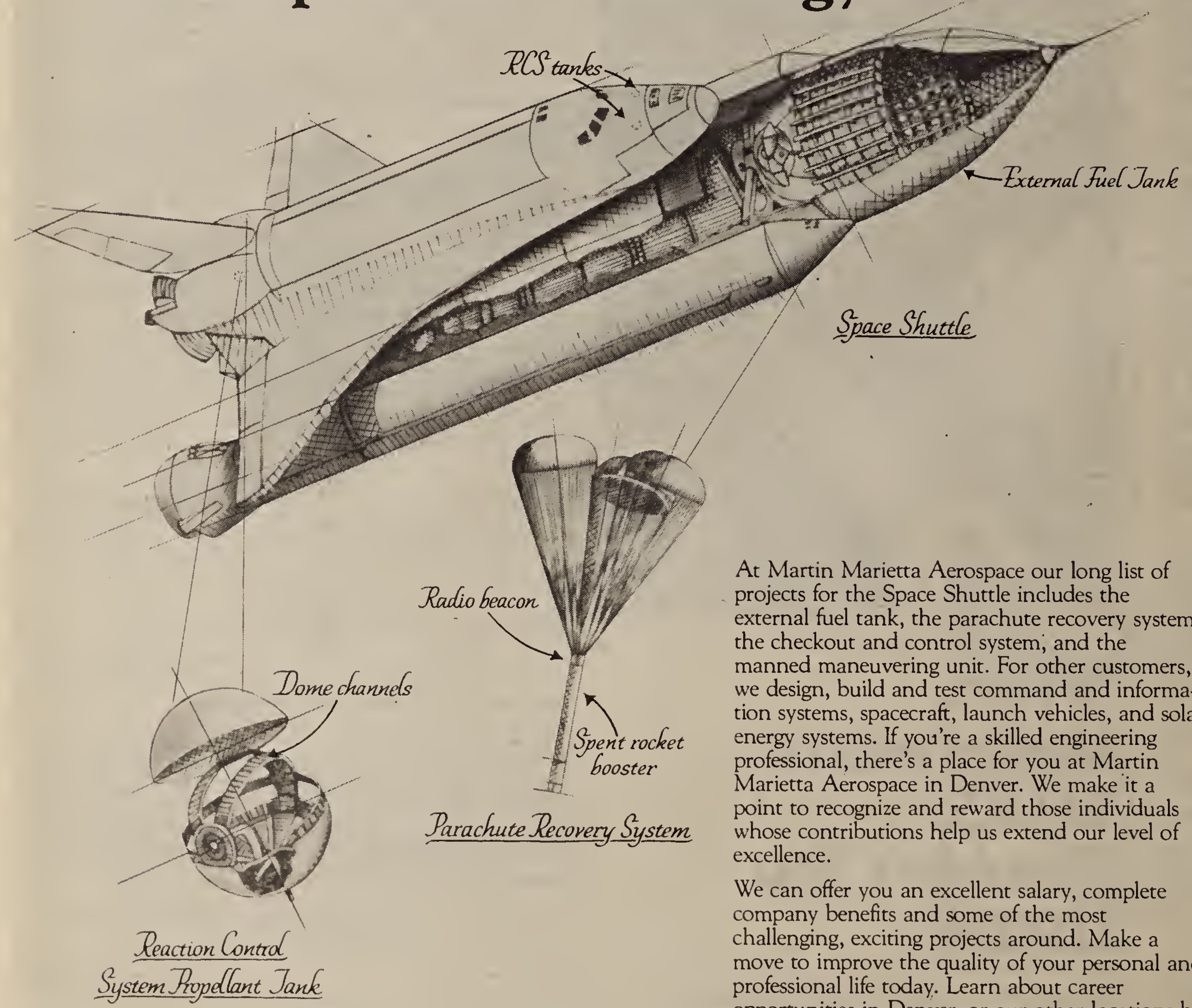

At Martin Marietta Aerospace our long list of projects for the Space Shuttle includes the external fuel tank, the parachute recovery system, the checkout and control system, and the manned maneuvering unit. For other customers, we design, build and test command and information systems, spacecraft, launch vehicles, and solar energy systems. If you're a skilled engineering professional, there's a place for you at Martin Marietta Aerospace in Denver. We make it a point to recognize and reward those individuals whose contributions help us extend our level of excellence.

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- Your product will look better and be easier to use. You'll save even more money because our shorter delivery time gets price changes to your dealers faster. (Time means Big Money during inflationary periods.)
- You will avoid delays and headaches related to internal priority and approval problems when you want to make changes to your catalog. Changes that require your computer staff to alter their programs. We have 12 Systems Programmers and make such changes in a few hours.
- O'Neil Data Systems has two large scale computers driving Advanced Computer Output Microfilm and Phototypesetting equipment plus our own automated printing facility; all on the premises. We don't ship out or subcontract any phase of your job. This means we do your job faster and at less cost to you.
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Contracts & Pacts

Aydin Corp. will provide the color graphics terminals for the World Wide Military Command & Control System for the U.S. Armed Forces. The seven-year, $20 million contract calls for Tempest-accredited terminals, including terminal processors, floppy disks, keyboard controllers, magnetic tape cassette units and a 19 in. high resolution color monitor.

LSI Logic Corp. and Toshiba Corp. have initiated a cooperative program to develop an advanced HCMOS logic array family of large scale integrated circuits.

Lexicon Corp. has won a contract valued at $419,900 from the U.S. Department of Defense for the purchase of a specialized hand-held computer.

The Customer Service Division of TRW, Inc. has signed a five-year agreement with Commodore Business Machines, Inc. under which TRW will provide service on national accounts for Commodore's CBM 8032, the 4032N and 4032B central processor with 8040 universal logic board, 8050 disk drives, 4022 matrix printer and 8010 communications modem.

Computing Devices Co., a subsidiary of Control Data Corp., has been awarded a $5 million contract to supply a portion of the mission support systems for the Nimrod Mk s maritime patrol aircraft. The Nimrod is used by the U.S. Air Force to provide surveillance of surface ships and submarines.

Digital Data Systems, Inc. has received an $800,000 contract from Berkel Systems, Inc. for the design, development and manufacturing of an advanced technology memory and processing system.

RCA American Communications, Inc. has been awarded a $15.3 million contract from the General Services Administration to provide an additional 608 encoded voice/data satellite circuits between six cities for government communications.

The U.S. Coast Guard has awarded a $41 million contract to C3, Inc. for a system of data and communications terminals to interconnect its offices and stations worldwide.

Apple Computer, Inc. and Southwestern Publishing Co. have joined in a cooperative effort to develop business-educational software packages.

Control Data Corp. has received a major OEM contract valued at approximately $5.6 million from Southern Systems, Inc. to supply the firm with its E-series band printers.

Compucorp, Inc. has been awarded a multiyear contract by the Library of Congress, Washington, D.C., for the installation of word processing systems of varying configurations.

Gnat Computers, Inc. has signed a major distribution agreement with American Peripheral Systems, Inc. that provides for American to purchase approximately $12 million worth of Gnat microcomputer systems over a five-year period.

Logicon, Inc. has received a $17.2 million extension from the U.S. Air Force Ballistic Missile Office to expand its participation in development of the MX intercontinental ballistic missile system.

Intel Corp. and Harris Corp. have entered into a technology exchange agreement for the design of complementary MOS microprocessors and peripherals.

Application Development Systems, Inc. has recently been awarded two contracts to develop and implement a court information system for the Superior Courts of Ventura County and a juvenile justice information system for the Superior Courts of San Bernardino County.

Harris Corp.'s Data Communications Division has installed more than 80 distributed data processing systems in the U.S. Department of Agriculture's (Usda) offices across the country as part of an agreement that could total $7 million. It allows Usda an option to lease as many as 118 Harris 1650 systems.

Advanced Micro Devices, Inc. of Sunnyvale, Calif., and Mostek Corp. of Carrolton, Texas, have completed negotiations for a joint agreement to develop and produce microelectronic components that will be used to provide communications capability for information systems utilizing Ethernet.

Western Business Computers has signed an agreement with Honeywell, Inc. for full marketing and service rights to the Honeywell DPS-6 small business computer over the next five years. This update agreement to a $250 million marketing contract is the largest such marketing agreement in Honeywell's history.

Tau-Tron, Inc. has received orders from Western Electric Co. for nearly half a million dollars worth of test sets for digital transmission systems.

Data Printer Corp. has signed a multiyear contract estimated at $25 million for its Model 3601 band line printer with West Germany-based Siemens AG.

Associated Computer Consultants, Inc. announced that two of its protocol handling devices have been selected by Ecom prime contractor RCA Corp.

Four-Phase Systems, Inc. of Cupertino, Calif., and National CSS, Inc. (NCSS) of Wilton, Conn., have concluded an OEM purchase agreement and a separate hardware maintenance agreement. Under the terms of the four-year OEM pact, Four-Phase will supply National CSS with System 311 and 312 computers. Four-Phase has also contracted to serve as National CSS' entire hardware maintenance operation for both existing and new NCSS 3200 systems.

Vector Graphic, Inc. has signed a contract with the General Services Administration covering sales of its microcomputer word and data processing systems and software to federal agencies and their contractors.

Linkabit Corp., a M/A-Com, Inc. operating company, has received a contract valued at more than $8 million from Satellite Business Systems (SBS) to design, develop and produce two cen-

(Continued on Page 80)

Nickels & Dimes

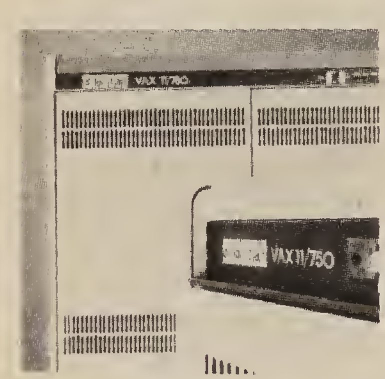
Solid State Technology, Inc. has petitioned the federal court to allow continued operations under the protection of Chapter 11 of the bankruptcy laws.

$ $ $

Cipher Data Products, Inc. has filed with the Securities and Exchange Commission for an initial public offering of 1,403,480 shares of its common stock.

Expansions

Micro Finance Systems, Inc. has moved to larger quarters at 180 Franklin St., Cambridge, Mass. 02139.



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SCHEDULED FOR DECEMBER 12, 1981

The annual examination for the Certificate in Computer Programming (CCP) will be held on December 12, 1981, at selected test centers throughout the world.

Specific requirements for this year's examination are detailed in the "Certificate in Computer Programming Examination Announcement and Study Guide." The study guide and application form for the 1981 examination are available on request from ICCP.

Deadline for Filing Application is October 15, 1981

Please forward the "Certificate in Computer Programming Examination Announcement and Study Guide" along with application and test site list.

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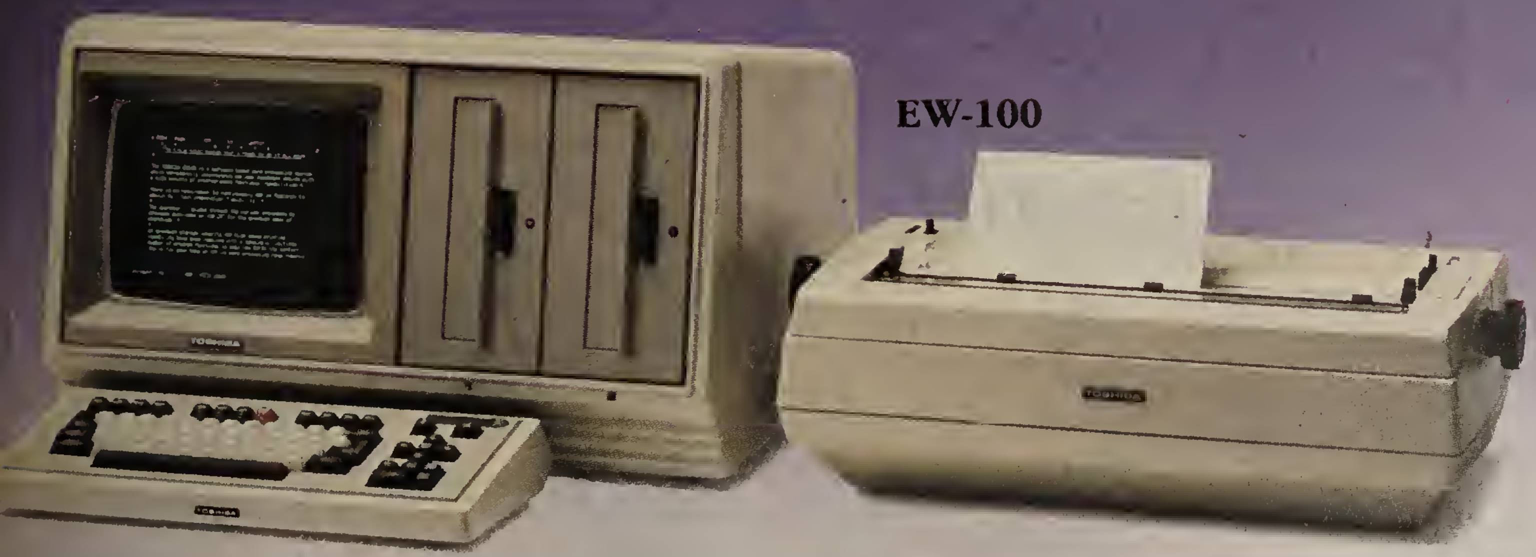
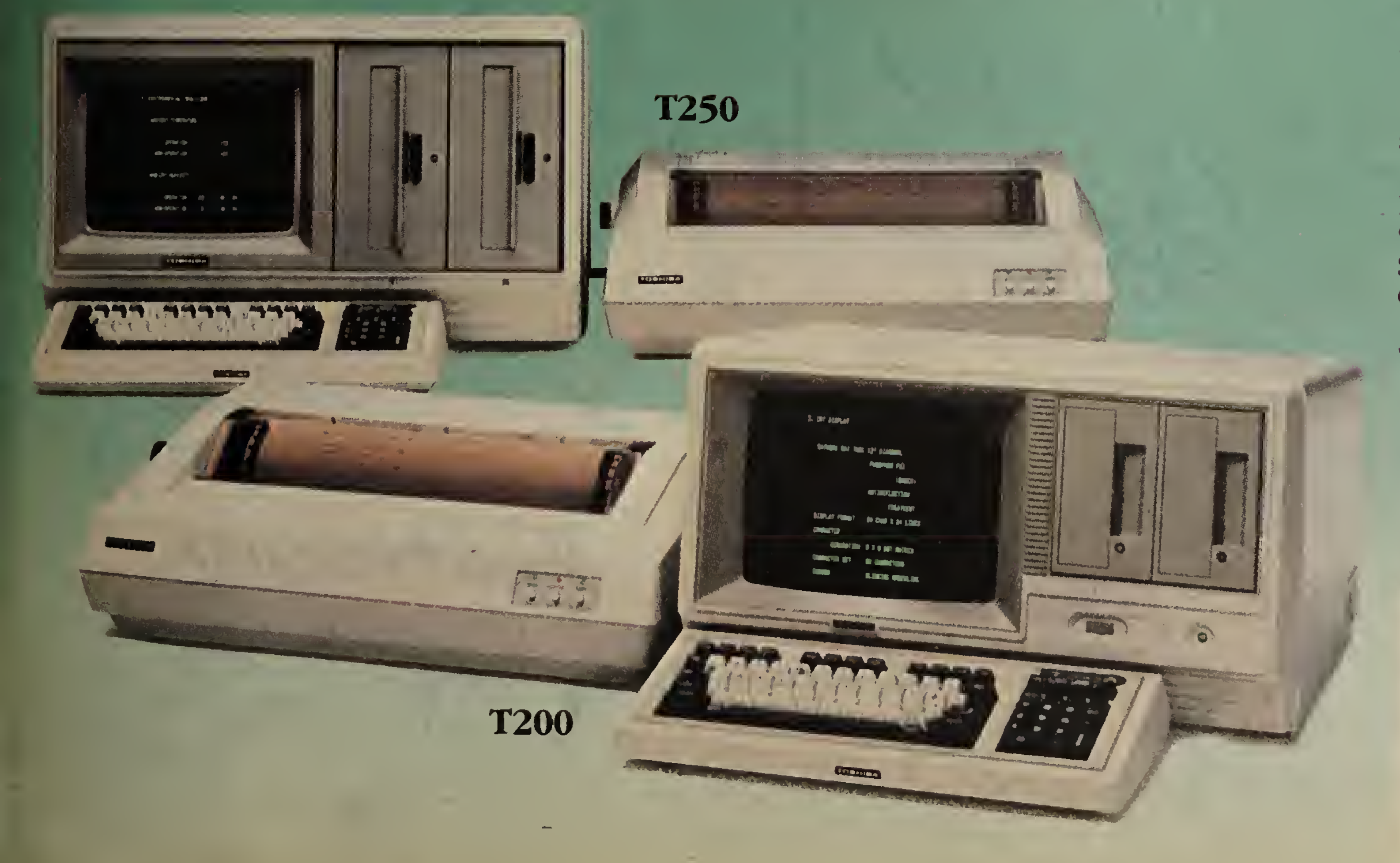


EW-100

display capacity: 80 characters × 24 lines
floppy disk: 8″
storage capacity: 300KB × 2,
1MB × 2
type of printer: daisy-wheel printer
printing speed: 45 characters/sec.
print pitch: 10/12/proportional spacing

VSBC (Very Small Business Computer)



T200/T250

Hardware

memory: 64KB
display capacity: 80 characters × 24 lines
floppy disk: T200: 5¼″
T250: 8″
storage capacity: T200: 280KB × 2
T250: 1MB × 2
printing speed: 125 characters/sec.
characters per line: 136 characters

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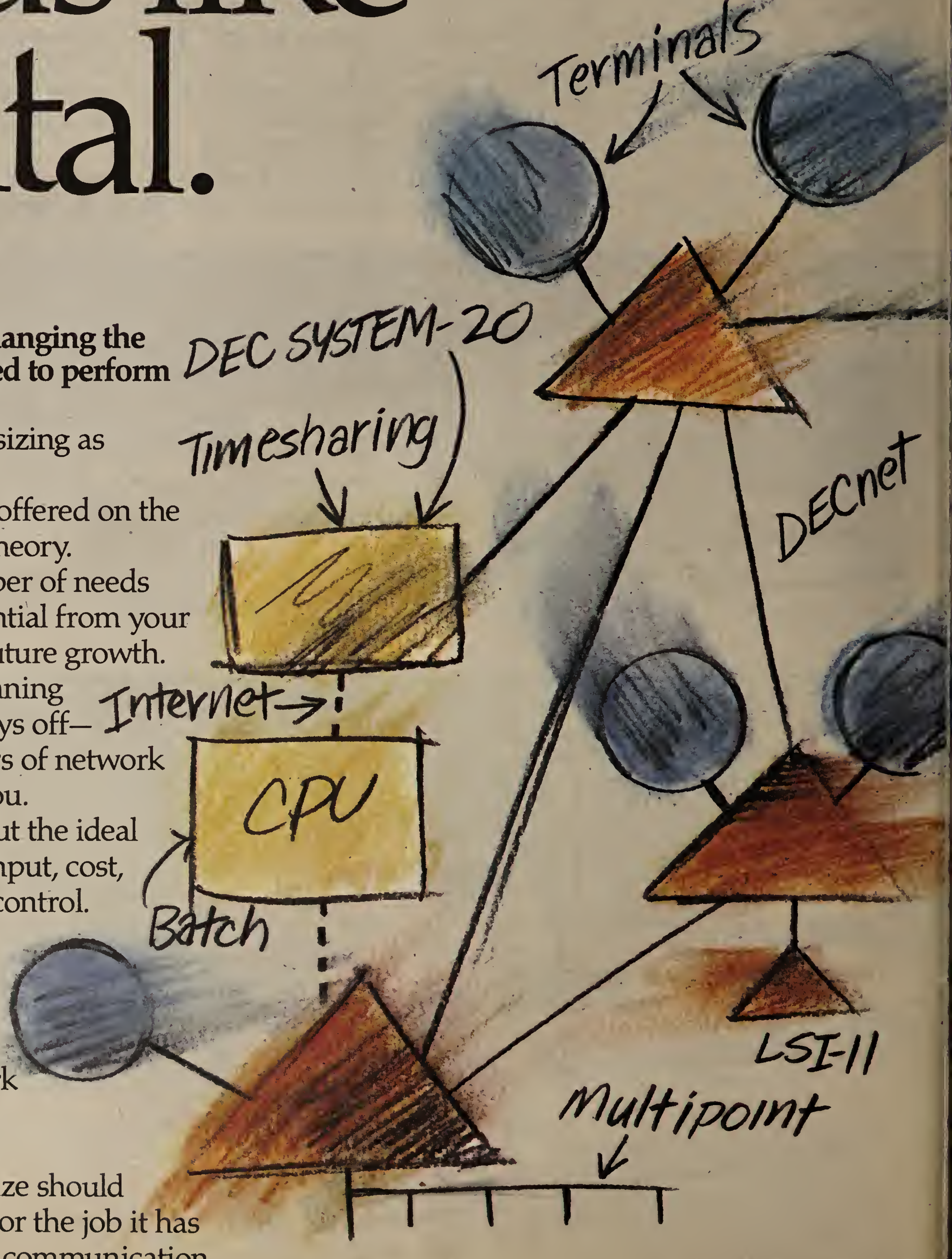

Digital's know-how is changing the way networks are planned to perform right from the start.

Not everyone takes sizing as seriously as Digital.

You'll see networks offered on the "one technology fits all" theory. Networks that fill a number of needs but may not get top potential from your investment or allow for future growth.

At your earliest planning stages—where it really pays off—you can put Digital's years of network experience to work for you.

Experience works out the ideal balance of speed, throughput, cost, data integrity, flexibility, control.

Experience asks the right questions to start with. Basics such as: What business problem do you want your network to solve? What systems must communicate?

To specifics: What size should each individual node be for the job it has to do locally? How much communication

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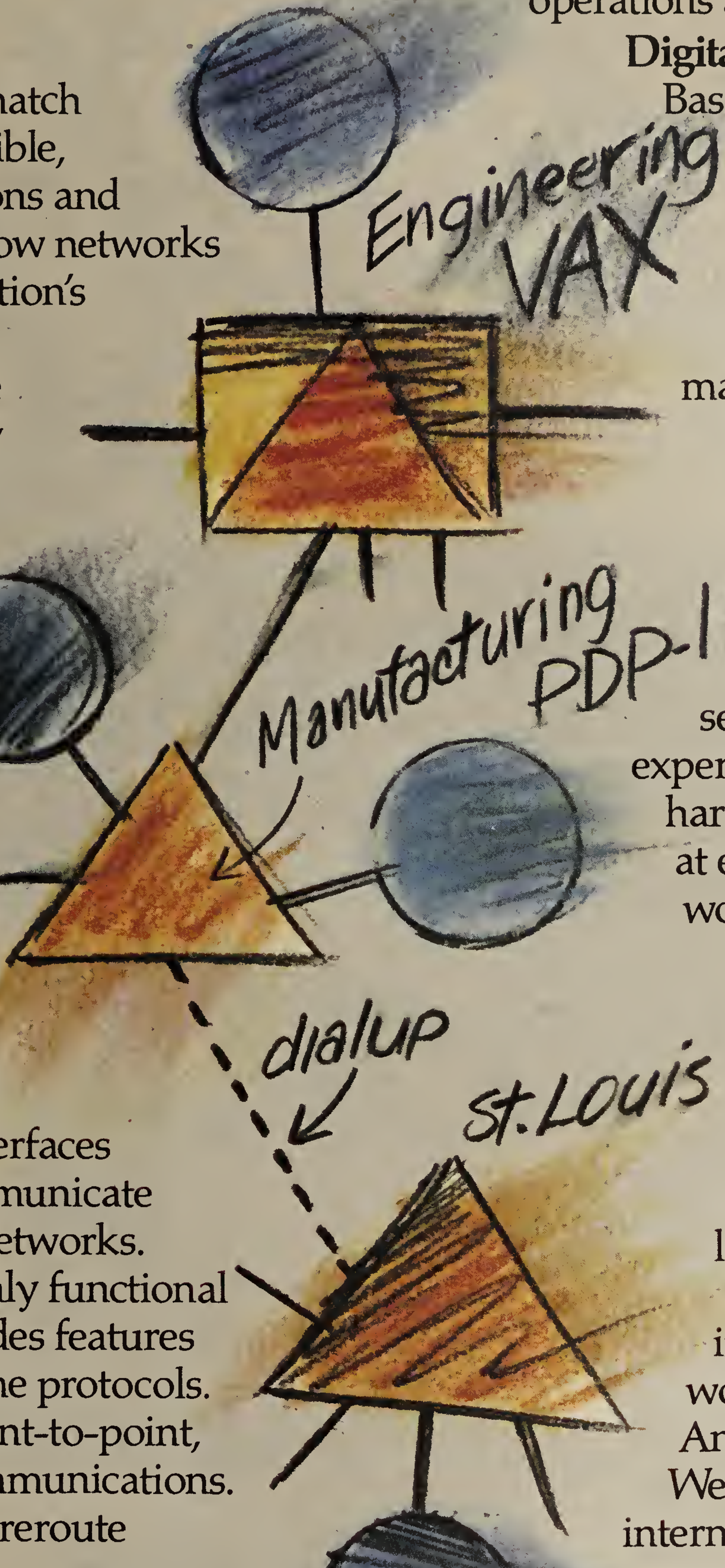

edundancy should be planned to avoid
owntime? What options are possible later
or future growth?

And how do you meet your require-
ents most economically?

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No other vendor can match
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nd other standard
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ications protocols.

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lows Digital systems
participate in
M/SNA networks.

And Digital offers
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Vith DECnet, you have point-to-point,
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etwork operations can continue even when
mmunication links or nodes fail.

Even add new nodes without shutting
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mplete control.

our Digital Network Profile.

A Digital team of networking experts will
ork closely with you, from concept through
stallation through support.

First, a written Profile details your network
quirements. The number and location of each
oposed node, each terminal. Types of network applications. Volume of data to be transferred between individual nodes. Data urgency and importance. Line and system reliability, availability, and maintainability. Costs. Network operations and security. Future growth.

Digital's Customer Support Plan.

Based on your Network Profile, our experts, working with you, document how Digital will help satisfy your needs. Installation, start-up, training, network maintenance, troubleshooting. This plan clearly spells out what Digital will do, when it will be done, and how it will be accomplished.

Following this thorough preplanning, Digital field service and software support experts will install and verify the hardware and software needed at each node, and demonstrate working network connections.

Digital planning leads to Digital performance.

A working network, ready to go. Ready to perform to the maximum now. Capable of expanding later as your business grows.

To date, Digital has implemented over 5,000 network nodes around the world. And we don't just install them. We support them, too, with an international team of over 14,000 service people. At Digital, we're changing the way technology works for your needs.

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Contracts & Pacts

(Continued from Page 76)

tral reference stations to be used in the SBS satellite business communications systems.

Planning Research Corp. has received a $3.9 million contract modification to expand its support of a major military command and control program at Fort Monmouth, N.J. The program, called Joint Interoperability of Tactical Command and Control Systems, is intended to assure U.S. military services and defense agencies an effective exchange of tactical command and control information during joint military operations.

Kemper Insurance Group, Inc. has signed a multimillion dollar contract with the Policy Management Systems Division (PMS) of Seibels, Bruce & Co. to use the PMS applications software package.

GTE Satellite Corp. has awarded a contract valued at more than $100 million to RCA to construct three satellites as part of a new system to transmit voice, data and images to all 50 states.

The Naval Ocean Systems Center has awarded Computer Sciences Corp. a contract for systems engineering and technology services. The contract is valued at $3.2 million the first year and contains renewal options for two more years.

Diebold, Inc. and the newly formed Electronic Financial Services Division of Automatic Data Processing, Inc. (ADP) have signed an agreement to install a Tabs 9000 Automatic Teller Machine (ATM) at ADP's first owned and operated ATM network site.

Minicom Systems, Inc. has renewed its contract with the Western Dynex Division of Perri Co. to purchase Series 6000 Cartridge Disk Drives.

'Localnetter' Plans Listing

MINNEAPOLIS — "The Localnetter" newsletter is compiling a list of local network equipment manufacturers. Names of manufacturers who build local networks and components are sought.

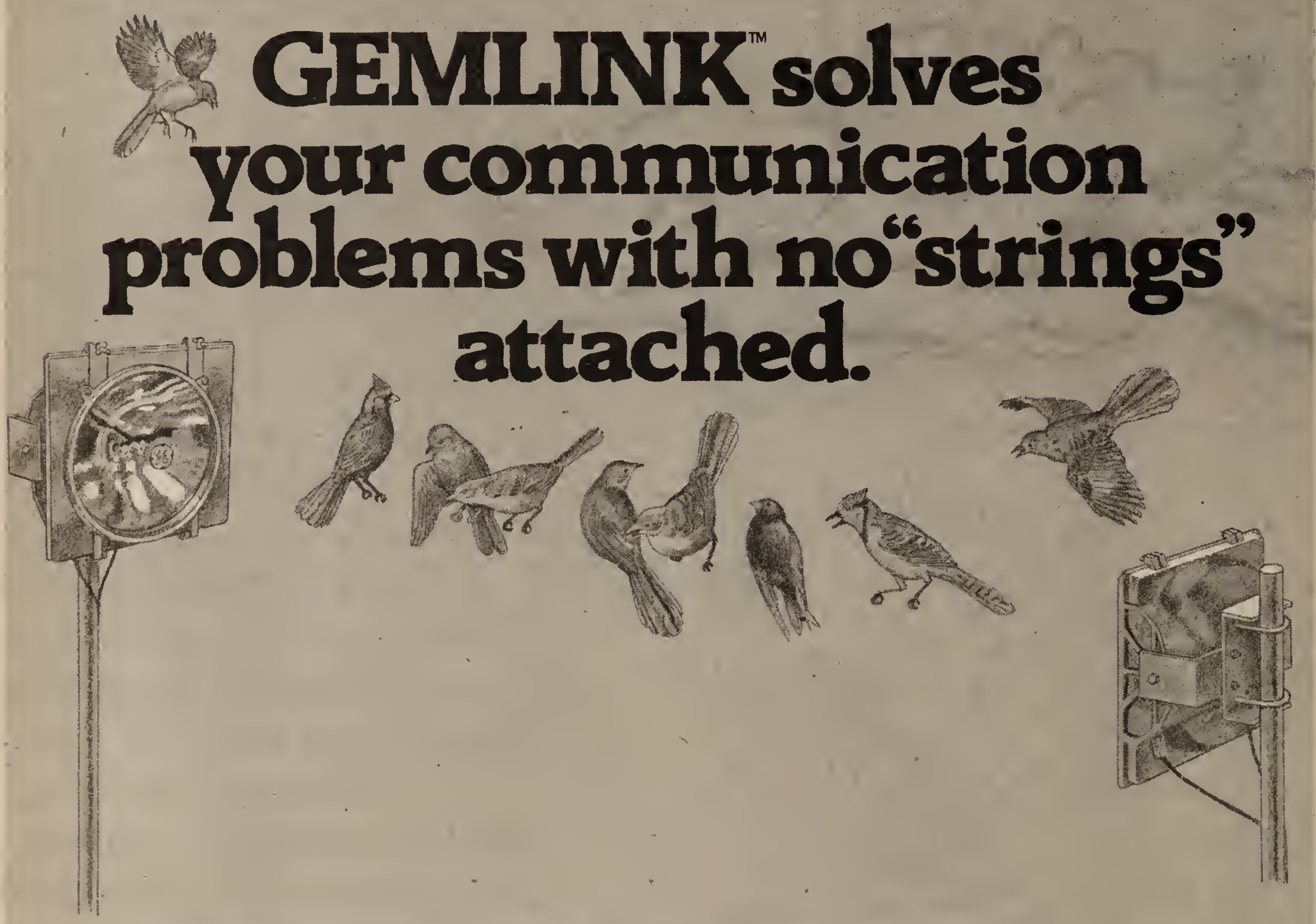
A special report based on the information will be available in the newsletter late this year or early in 1982. Names should be sent to Kenneth Thurber, "The Localnetter," P.O. Box 24344, Minneapolis, Minn. 55424.

Technical Writing Course Planned

BOSTON — A program designed to train writers for technical writing careers in computer-related industries will begin here this fall at Northeastern University. The one-year program combines evening courses in programming and technical writing with editor-trainee internships.

The certificate granting program costs $4,400, Northeastern's standard graduate tuition fee for four quarters of full-time work.

More information is available from Prof. Helen Loeb, Department of English, 145 Holmes Hall, Northeastern University, 360 Huntington Ave., Boston, Mass. 02115.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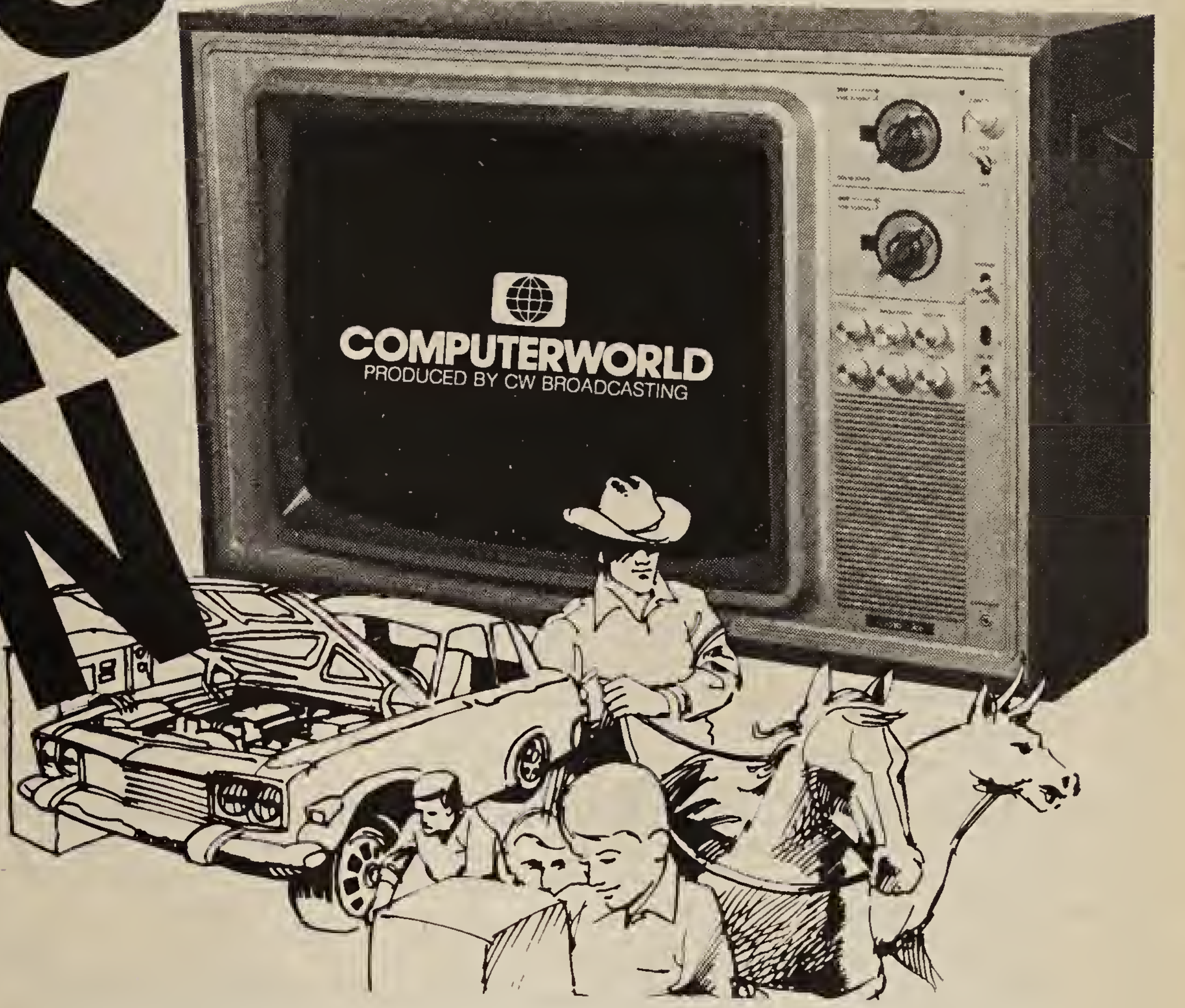

Does the computer really improve an auto tune-up?

Will computers and white hats catch the rustlers?

Can kids and computers find happiness together in Sesame Place?

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Market	Station	Ch	Day	Time
New York*	WOR*	9	Sat	9:30AM
Los Angeles	KWHY	22	Sat	Noon
Chicago	WFLD	32	Sat	9:30AM
San Francisco	KTSF	26	Sat	9:30AM
San Jose	KSTS	48	Sun	4:30PM
Philadelphia	WTAF	29	Tues	10:30PM
Boston	WXNE	25	Wed	10:30PM
Washington, DC	WDCA	20	Sat	12:00Mid
Dallas/Ft Worth	KNBN	33	Sat Tues	12:30PM & 7:30AM
Detroit	WXON	20	Sat	10:00AM
Houston	KHTV	39	Mon	12:00Mid
Atlanta	WATL	36	Sat	1:30PM
St Louis	KDNL	30	Sun	5:30PM

*Many cable systems around the U.S. carry WOR, a "superstation." Check your local listings.

There's a lot that's new on "Computerworld" this fall. New format, new talent, new graphics, new features. And it starts this week on a station near you. (We're also changing some of our stations and times, so look over the schedule carefully this week and in the weeks to come.)

This week, you'll join the "Computerworld" cameras at Sesame Place in Pennsylvania where kids pay a fee to play all sorts of games on Apple computers. It's a variation on the traditional game room that may be starting a nationwide trend.

Then you'll go along with Len Lawrence as he tries to answer the question: Do the computerized auto tune-ups really do a better job than the old-fashioned kind? Or are they just using the computer as a selling gimmick?

Plus, we'll take a journey out west where the cattle don't roam much anymore, but they still do get rustled. Computers are being employed by the cattlemen's association in an attempt to track down the steer-stealers. You'll go along for the ride.

And there's more to see as "Computerworld" launches its new fall season. Check the schedule and make sure you and the family don't miss the big opening show.

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In Saudi Arabia, Aramco is involved in dozens of incredibly large and complex projects. Probably nowhere else in the world is modern technology being employed so widely. Aramco Services Company in Houston plays a significant role in all of it. If you have the qualifications, we have the following openings now in Houston.

Systems Analysts

We're looking for an individual with a minimum of 10 years' experience in a primarily large IBM compatible environment. Proficient at technology investigations, special studies in areas like graphics, word processing, mass storage, network directions, and/or any similar emerging technologies.

We are also looking for a systems analyst with 4 years of DP experience, with at least 2 years on staff or the applications development areas. This position is administrative in nature involving budgeting, contracts, project control, and DP chargeback. There is an excellent opportunity for advancement to a supervisory role.

Data Dictionary Analyst

We need someone with a minimun of 3 years' experience in IMS, at least one of which involves data dictionary use, including data dictionary planning, standards, procedures, etc.

Data Base Analysts

A minimum of 3 years' experience is required in IMS data design for on-line systems. Familiarity with logical relationships and secondary indices is a must, and ADF and/or PLI would be helpful.

Data Base Support Analysts

Required is a minimum of 2 years' experience in IMS system support, including use of BTS, IMS utilities, and DB performance and tuning tools (IMSPARS, IMSASAP, DB and DC monitors, etc.)

MVS Systems Programmer

Successful candidate will need a minimum of 7 years of systems support, including at least 3 years supporting MVS. You must also be familiar with SMP-4 and JES2. TSO support and NJE support would be helpful, as would ACF2.

General Systems Programmers

Needed is 3 years of DP experience, with at least 1 year of installing program products, managing DASD environment, troubleshooting systems problems (JCL, compilers, dumps, etc.).

Commercial Programmers

Required is 2 years of DP experience, as well as familiarity with PLI, OS/MVS, JES2, JCL, and IMS DB/DC. Some experience with systems analysis and structured techniques is required. Also experience with projects involving treasury, industrial relations and payroll areas.

We also need Commercial Programmers having a minimum of 3 years' experience, and familiarity with PL1, TSO, IMS DB/DC, OS utilities, and MARK IV/SAS. You will be responsible for developing and maintaining software in our operations, purchasing and traffic systems.

Commercial Analysts/Programmers

Required is a minimum of 3 years' experience in design, analysis and programming of commercial applications systems, and a minimum of 2 years in IMS on-line DB/DC and PLI. ADF and MARK IV experience are highly desirable.

Training Analyst

Needed is 3 years of DP experience one of which is in an EDP training-related capacity. You'll coordinate and assist in the administration of departmental training programs.

Standards & Procedures Analyst

We're looking for someone with 3 years of DP experience including systems analysis and technical writing. You'll develop standards, procedures and manuals, and conduct research and analysis to ensure quality and consistency of documents.

All positions require a BS or BA in Computer Science, Math, Business, or related field.

Send your résumé in full confidence, or write for more information to: Aramco Services Company, Section DOM, Department CW0907TF04A, 1100 Milam Building, Houston, Texas 77002.

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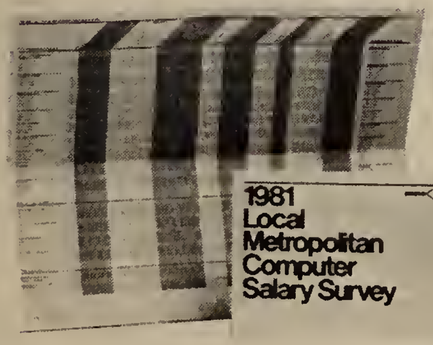

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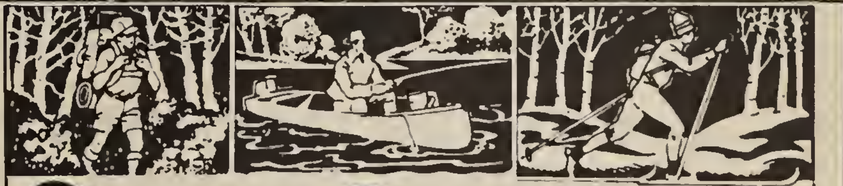

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TASKS:

Participate as a team member and lead person for the evaluation of MDP compiler projects. Assist in the creation and review of thorough test plans and test cases, the execution of tests, and the analysis of the results. Strive to improve upon the automation of the evaluation process to increase the efficiency and accuracy. Test at a more in-depth level than functional through understanding of the internal design. Represent the compiler evaluation team at various project meetings and interface with other groups. Take appropriate steps to assure that the compiler products are maintainable, usable, and free of bugs when released.

COMPETENCIES REQUIRED BY TASKS:

Bachelor of Science degree in Computer Science plus 2 years experience as a Software Design Engineer I or Software Evaluation Engineer I with at least 6 months experience with a DEC 11/70 system and at least 6 months experience testing software in a product development environment OR a Master of Science degree in Computer Science with 1 year of academic work in compiler architecture and at least 6 months experience with a DEC 11/70 system and at least 6 months experience testing software in a product development environment.

Thorough understanding of all elements of a complex compiler product. Thorough knowledge of PASCAL and software design principles, and ability to analyze PASCAL code for adherence to specifications. Working knowledge of at least 3 standard engineering type high level languages and at least 2 engineering type assembly languages. Must be able to review detailed compiler design specifications and to translate design requirements into thorough, easily verified test cases. Must be well organized, be able to work unsupervised, and be capable of handling several complex, related tasks simultaneously. Must be able to train others and monitor their technical work on compiler products. Excellent oral and written communication skills and the ability to interface with other groups on compiler topics.

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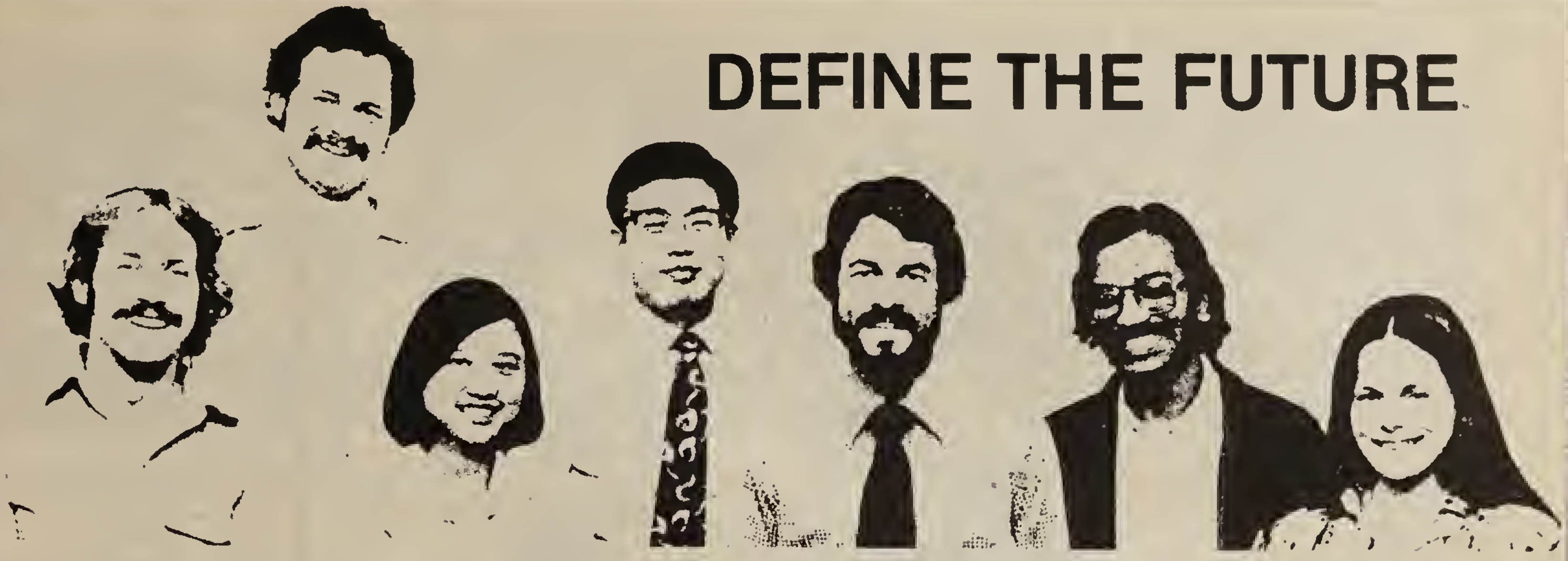

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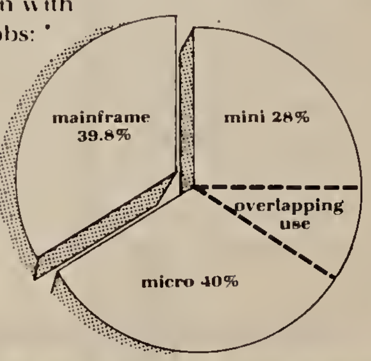

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KINGDOM OF SAUDI ARABIA
COLLEGE OF MEDICAL SCIENCES
UNIVERSITY OF RIYADH-ABHA BRANCH

ABHA, SAUDI ARABIA

A new College of Medical Sciences, under the auspices of the University of Riyadh, is being established in Abha, the high mountainous South West region of Saudi Arabia. The first intake of students is planned for September, 1981 and teaching staff ara now being sought for the following disciplines:

Computer manager	Librarian
Epidemiologist	Family and Community Medicine
Health planner	

An exciting and challenging opportunity is offered in an attractiva environment with equitable climate. Responsibilities will include participating in the commissioning of the school and teaching in the Bachelor degree programmea. The language of inatruction is English.

BENEFITS

Salaries are highly competitive. Benafits include–free furnished accomodations or an accommodation allowanca, local transportation allowance, educational assistance for up to four children, a paid 60 day holiday, round trip to place of origin onca a yaar to include family and an end-of-service bonus.

Applications will be held in strictest confidence and all will be acknowledged. Interviewa will be held in the USA, Canada and the U.K. towards the end of 1981. Please send three copies of a complete curriculum vitae with name, addrass and telephone numbers of 3 referees to:

Dr. Zohair A. Sebai, Dean
College of Medical Sciences
University of Riyadh-Abha Branch
C/O

Dr. A.T.G. Johnson
Saudi Educational Office
29 Belgrave Square
London SWIX-8QB
England

Mrs. Jeri Dowhan
C/O Saudi Arabian
Educational Mission
2425 West Loop South
Houston, Texas 77027

Mr. Essam Shaikh
Saudi Educational Mission
Sutte 1144-99 Bank St.
Ottawa, Ontario
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System Industries manufactures minicomputer peripheral equipment and systems. We're the world's largest independent supplier of disk memory subsystems. We're small enough to really experience the team spirit that has made us so successful. And the contribution of every individual at System Industries has given us all the opportunity to experience rapid growth as well.

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System Industries

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If you have a minimum of 1 year of experience, call collect (or send resume) to: **Ann Barker**

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Suite 121
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(615) 329-1771

SYSTEMS ANALYST

The Department of University Computer Systems is looking for an individual in Technical Services with one or more years experience in one of the following areas: VM/CMS/MVS/OS/CICS. The University Computer Systems Department has an IBM 370/158AP and an IBM/370/168-1 and plans major upgrades in hardware in 1982. Candidates must possess a Bachelor's Degree in a relevant discipline or have an equivalent combination of education or experience. **Reply by October 5, 1981 to Peter Furmonavicius at the University Computer Systems, U-138, University of Connecticut, Storrs, Connecticut 06268.**

Equal Opportunity Employer h/v

SYSTEMS ANALYST/ PROGRAMMER

2 yrs exp. or 2 yrs exp in Programming. 4 yrs High School. Must have knowledge of COBOL. Design & implementation of computer systems. Maintenance & enhancement of these systems, and provide vital skills which ensure their sucessful and cost effective operation. $482. per week to work 35 hours/5 days/ week. Please send resume to: **Software Design Associates, Inc., 260 Madison Avenue, New York, N.Y. 10016.**

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I have an urgent need for the following people:

COBOL P/A, any apps., DOS OK	- to 23K
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RPG II, Mfg. apps	- to 25K

If you're SERIOUS and able to relocate, contact me immediately:

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All service charges, relocation, and interview expenses are paid by client companies.

Computer Professionals

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COMPUTERS & ELECTRONIC SYSTEMS

AL-KHALEEJ, a rapidly growing Saudi consulting firm, ia seeking highly qualified professionals in both the technical areas of systems analysis and programming as well as in information systems and organizational management. Consulting projects include making recommendations of hardware needs, developing system requirements, and implemementation of plana for privately owned Saudi companies and numeroua government agencies. Specific areas addressed are such business systems as personnel, payroll, accounting, and inventory using data bases, word processing equipment, and micrographics

Consulting staff candidates should possess at least a bachelor's degree in a computer related field and 6 to 10 years of experience. Three of these years must be a management level with heavy user contact.

Analysts and Programmers require a minimum of an associate degree in data processing with 3 to 6 yaars experience in systems development using COBOL and IBM CICS.

Compensation package consists of salary plus such benefits as completely furnished housing with all utilities, transportation allowance, financial assistance in children's education, health expenses, and a vacation package.

To apply, send resume with salary history, salary requirements, and availability time to Al-Khaleej, P O Box 13296, Richmond, Va 23225

SYSTEMS PROGRAMMER

At Miami-Dade Community College, the nation's largest community college, the challenges within our sophiaticated Data Processing Department ara constantly axpanding. Wa need a talented, experienced profassional to help us provide resourceful hardwara and softwara solutions to our data processing problems.

In key position, you would conduct feasibility studies of proposed new systems or for hardwara and/or softwara improvementa to axisting syatems and maka the necessary hardwara and softwara recommendationa, including the development of bid specifications as required. Work also includes acting as a consultant to the operations, programming and academic ataff to provide guidance and direction.

This position requires five years axperience as a systems softwara programmer, systems analyst, and/or applicationa programmer. Two of your years will hava been spent as a systems softwara programmer on large IBM systems (OS/MVT, OS/MVS). Your background should demonstrata proficiency in conducting feasibility studies, project Implementation, and solid axperience on mini and micro computers and a baccalaureata degree in computer science or a related field is required.

We ara offering an attractive salary and an outstanding benefit package. You will enjoy our pleasant South Florida surroundings. For immediate consideration, send two copies of your resume in confidence to: **Personnel Services, South Campus, 11011 S.W. 104 St., Miami, FL 33176. Applications accepted through September 14, 1981.**

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POSITION ANNOUNCEMENTS

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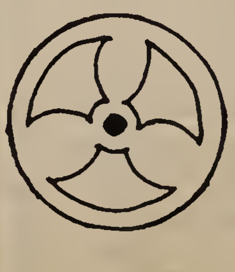

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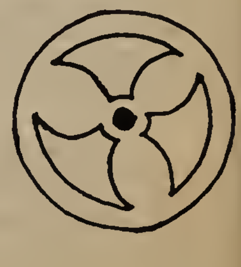

SOFTWARE DEVELOPMENT PROFESSIONALS

If you want to be on top tomorrow, you want us today.

Today, in San Francisco, a software development team of major importance to the insurance/finance industry is in its start-up stages.

The team's mission: to develop innovative minicomputer-based distributive processing systems for insurance/financial applications. Backed by the resources of a major corporation, the team members will have access to the most advanced equipment and will work within a highly challenging, entreprenurial environment.

There's a place for you on our team—on the ground floor—if you've got the talent, experience and creativity to contribute to our success. The pace will be furious, the rewards unsurpassed. If you're ready to find out more, check these opportunities, then get in touch with us—today!

Systems Programmers

Must possess 2 to 4 years of systems programming experience within distributive processing environments. Experience with the IBM Series 1 minicomputer and EDX or RPS operating systems are definite pluses.

Planning Analyst

Must possess 5 to 7 years of data processing experience with strong analytical emphasis. Background must include a thorough understanding of PERT/CPM methodologies and strong communication skills both written and verbal.

Field Support Manager

Must possess 10 to 14 years' DP management experience and be familiar with the operation of software support in a customer service organization.

Project Leaders

Must possess 6 to 8 years of data processing experience utilizing structured methodologies in a DB/DC environment.

Programmer Analysts

Must possess 3 to 5 years of programming experience within distributive processing environments.

The individuals selected will be highly motivated as this environment will be very results-oriented.

In addition to an outstanding salary, you can look forward to excellent benefits, including dental and life insurance, a choice of three medical plans, incentive savings, educational assistance, fully paid retirement and comprehensive relocation assistance.

Please send your resume, including salary history to:

P.O. Box 7121 Dept. 55
San Francisco, CA 94120

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With World-Wide Travel Opportunity

Saudi Arabian distributor of construction equipment invites applicants for following positions:

SENIOR SYSTEMS ANALYST

Minimum 5 yrs. experience in DBDC systems.

PROGRAMMER/ANALYST

Minimum 3 yrs. experience designing and programming on-line commercial systems using Cobol.

PROGRAMMERS

Minimum 2 yrs. Cobol experience in data base/data communications. Preference will be given to applicants with training and experience with NCR VRX Tran-pro and Total.

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For corrective & preventative maintenance of 4 V8500 systems, must have NCR training & exper. in these systems & related peripherals.

2 YEAR RENEWABLE CONTRACTS

Provide excellent salary & benefits. Status-single or married unaccompanied with $5000 p/a separation allowance. Family status with education assistance if suitably qualified. Housing & medical care provided. Liberal home leave and air-ticket policy exempt from income taxes for U.S. interviews in November.

Air mail reply to:

D.P. Manager
PO Box 8928
Jeddah, Saudi Arabia

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Opportunity to play a lead role in development of commercial applications in an ON-LINE, REAL TIME environment. 2+ yrs. FORTRAN programming with user interface & MINI exp. Develop & install systems at various branches throughout country. 25% travel. $35,000.

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Potential for significant career growth with this multi-billion dollar conglomerate. 4+ yrs. DOS BAL programming. COBOL programming &/or teleprocessing exp. is a definite plus. Responsibilities include development of ON-LINE trading system using IDMS. No ceiling on dollar potential. $35,000.

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Very promotable & rewarding opportunity in beginning stage of 8 year development project. 4+ yrs. in EDP, OS COBOL programming & 1+ yrs. structured design exp. 100% development in multi 3033, OS, IMS environment. Outstanding fringes including 3 weeks vacation. $28,000.

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EDP Training Administrator/Teach	$20 up
100 + openings-Prog./Analysts	$15-30K
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MVS Systems Programmers-several	$25-32K
DOS Systems Programmers (12)	$26-33K
Financial Systems Analysts (8)	$22-29K
Process Control/micro-proc.	$25-30K
Manufacturing Systems Analysts (18)	$23-29K
Cost Allocation Sys. Analyst	$25-30K
GMAP Programming/Database design	$23-28K
Systems Analyst/FORTRAN/HP3000	$20-28K
DATAPOINT Programmer Analysts	$18K up
Utility Systems Analysts-IMS/COBOL	$25-30K
Payroll/Personnel/Finan. Sys. Anal.	$17-28K
EDP Auditors	OPEN
Systema 34, System 38, MAPICS	$16-25K
System 38/communications, trucking	$18-23K
MARK IV coding, database Wang 2200	To $30K

Call Today: Kay, Chip, or Jane, Personnel Placement, 537-D Huffman Mill Road, Burlington, NC 27215 (919) 584-5591. Send resume with salary requirements.

Data General

Manager, Systems Programming

Data General Corporation's Small Business Systems Division, located at the Research Triangle Park, North Carolina, seeks a manager for its Systems Software Organization. This includes language development (compilers and interpreters), operating systems (VM handler, scheduler, device drivers), and data base management software.

Responsibilities include scheduling and coordinating all system software; functional and detail level design review; and interfacing with hardware development, applications programming, technical writing, and product support groups in the maintenance and development of complete business systems.

Candidate should have a broad background in software development, good small business systems knowledge, and fundamental management skills.

All qualified applicants should forward resumes to: Personnel Manager, Data General Corporation, 62 T.W. Alexander Drive, Research Triangle Park, NC 27709.

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Corporate Computer Services Manager

Chief Data Center(s) Manager

At Signetics, a worldwide leader in the design, manufacture and supply of integrated circuits, we are proud of the Good People who make it happen. If you are an energetic, self-starting Data Center Manager with a proven track record as both a people and a business manager, we could have a significant new challenge for you as our Chief Data Center Manager. This is a highly visible position in a multi-million dollar, multi-CPU, multi-national emerging state-of-the-art facility.

Reporting directly to the Corporate Information Systems Director, you will have full charge of the San Francisco Bay Area corporate headquarters computer operation, as well as policy-making responsibility for five remote computer facilities in the U.S., Asia and Europe. You will also take responsibility for company-wide systems programming, computer equipment and facilities planning, and computer networking.

To qualify for this position you will need 10 years of professional data processing experience including at least 5 years in data center management in an IBM environment as well as BS/MS in Computer Science or equivalent combination of education and experience. Some scheduled overseas travel will be required.

To apply, send your resume, in confidence, to Joyce Cordi, Signetics, 811 East Arques Avenue, MS-2507, Sunnyvale, CA 94086. Or call her at (408) 746-2142. We are an equal opportunity employer.

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This new and exciting marketing position provides an opportunity to create an entire time sharing computer system to handle quick turn around data needs. In addition to the time sharing function there will be numerous opportunities to participate in the development of Major Data Processing projects. The person selected for this position will assimilate and use many information sources to provide thorough and timely response to data requests from different departments. Another responsibility will be the analysis and coordination of data requests to ensure maximum use of the time sharing system.

We are looking for the unusual, detail oriented individual who will also see the full scope of the business situation creating the need for information. This person must have superior interpersonal skills to effectively interact with people from many departments while gathering, processing and reporting data. If you have a Bachelor's degree in computer science, mathematics, or perhaps in business with a concentration of numerical course work, a strong desire to work in a Mktg. Dept. and at least three years of experience in programming and system design, we would like to hear from you. Add an MBA and experience with time sharing software packages in a pharmaceutical marketing application and we should definitely talk. If you have the qualifications we'd like to show you why this is an exceptional opportunity.

INNOVATION

MEAD JOHNSON, a dynamic subsidiary of Bristol-Myers, is a leader in pharmaceutical and nutritional products. Our uninterrupted growth is the direct result of our innovation. Our operating style encourages personal creativity and contribution. We're successful and thoroughly professional. We have a strong heritage of accomplishments and a strong future.

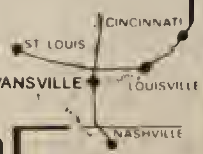
LOCATION

MEAD JOHNSON is located in Evansville, Indiana, a community of beautiful residential areas, outstanding recreational opportunities, exceptional educational and cultural facilities, and more. Best of all, Evansville couples the advantages of southern economy with the changing beauty of four-season living

To investigate these reasons for joining MEAD JOHNSON is to discover a wealth of others: Excellent salaries, superb benefits including paid relocation, and real growth, both personal and professional.

Discover MEAD JOHNSON. When it comes to your career, no one can offer more!

FOR PROMPT CONSIDERATION, SEND RESUME IN CONFIDENCE TO: Steve R. Sons, Manager
Executive Search & Placement, Department #54,
Evansville, IN 47721
An Equal Opportunity Employer M/F/H/V



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SEATTLE

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ARE YOU
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- a creative problem-solver?
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- thrive on new challenges?
- sell ideas/concepts well?
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You could make a significant contribution to ENI as we develop the systems needed to take us through our second decade of growth.

ENI offers the challenge of a professional career in the forefront of oil and gas exploration activity plus the advantages of moderate climate, scenic environment, a variety of sports, cultural and leisure activitites, and easy commuting to our beautiful new suburban location.

MANAGER-SYSTEMS DEVELOPMENT: Through three project managers and a growing staff of professionals you will manage the analysis, design and programming of all systems development, including marketing, administrative, exploration/production and financial applications.

The successful candidate will have 10 years' experience in data processing, including 2-3 years supervising systems development professionals. Six to eight years of your experience must have been in developing/maintaining applications in the petroleum industry.

We have a strong preference for an MBA with undergraduate degree in Accounting, Geology or Engineering

Equal Opportunity Employer

ENI
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Exploration
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Send resumes to Personnel: 1417 - 116th Ave. N.E., Call No C-21611
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SYSTEMS PROGRAMMER

VM/CMS

northAmerican Van Lines is a rapidly growing transportation firm and member of the PepsiCo family. Due to our rapid growth, we can offer exceptional opportunity to a results-oriented Systems Programmer who can provide the lead technical support for our information center and office automation program.

The successful candidate for this challenging position should possess a minimum 2 years experience as a Systems Programmer utilizing VM/CMS.

Based in an attractive medium-sized midwestern city, you will enjoy a competitive salary, comprehensive benefits and a quality of life which is both pleasant and affordable. To be considered for this growth opportunity in our state-of-the-art shop, please send your resume for prompt, confidential review to:

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P.O. Box 988
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EDP MANAGEMENT / SYSTEMS ANALYSTS/PROGRAMMERS, $20,000-$48,000+. Choice upstate NY & U.S. openings. Entry level thru top corporate positions. EDP placement specialists. In confidence send resume or call James F. Corby, Pres., NORMILE PERSONNEL, 5 Leroy St., Box 110 Westview Station, Binghamton, NY 13905 (607/723-5377).

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npc NATIONAL PERSONNEL CONSULTANTS

SYSTEMS PROGRAMMER/ ANALYST

- Engineering Applications
- FORTRAN Required
- Integraph (Turnkey): PDP 11/44

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Ad closing is every Friday, 10 days prior to issue date.

Rates: Open rate is $84.70 per column inch. Columns are 2" wide. Minimum ad size is 2 column inches (1 column wide by 2 inches deep), and costs $169.40 per insertion. Additional space is available in half-inch increments. Some sample sizes and costs are shown.

1 col x 4" — 338.80
2 cols x 4" — 677.60
2 cols x 5" — 847.00
2 cols x 8" — 1355.20

Discounts are available when you run more than 35 column inches of advertising in a year anywhere in Computerworld. Box Numbers are available. $10 per insertion.
Ad Closing is every Friday, 6 working days prior to issue date (issues are dated Monday).

To reserve space for your ad, or if you'd like more information on Classified advertising in COMPUTERWORLD, call our office nearest you.

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New York - (201) 967-1350
Chicago - (312) 827-4433
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William J. Mills,
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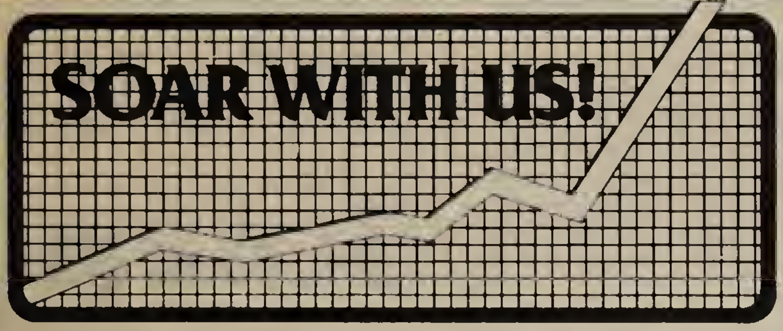
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BSEE with at least 2 years' experience in digital design using TTL LS/S and or processors TI 990 or 9900. Responsibilities include circuit design for various data communications equipment.

BSEE with 4 years' experience in digital design. Additional experience with microprocessor at both a hardware and software interface level required. Responsibilities include the design, development and support of various developmental data communications equipment.

BS MS EE with 1-3 years' experience in digital and analog design of communications and signal processing equipment and systems. Knowledge of modem operation and application helpful. Familiarity with common digital and analog IC chips required. Fundamentals of microprocessor application desirable. Responsibilities include the design and development of various data communications and signal processing equipment.

BSEE ET with 1-3 years' experience in troubleshooting at system, circuits and component level. Experience with the redesign or modification of digital analog circuits also required. Responsibilities include the troubleshooting and modifications of various data communications equipment and systems.

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An equal opportunity employer M/F

Data Processing

DATA BASE MANAGER/ ADMINISTRATOR

Ore-Ida Foods, Inc., a national leader in the frozen food industry, has an opening for a Data Base Manager/Administrator at our Company Headquarters in Boise, Idaho. Boise is located in one of the Northwest's major outdoor recreational areas.

The position will direct activities related to the administration of computerized data bases, including their definition, organization, protection, efficiency, documentation, long term requirements and operational guidelines. Prepare activity and progress reports, performance reports and consultation. Qualified applicants should have a BS degree plus four years experience in Data Base — preferably in IMS and/or DL1.

Excellent salary, liberal benefits and paid relocation provided. Send resume, including salary history, in confidence to **Employment Manager, Ore-Ida Foods, Inc., P.O. Box 10, Boise, Idaho 83707.**

Ore Ida

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INFORMATION SYSTEMS PROFESSIONALS

THE CHALLENGE OF CHANGE!

We're Avco Lycoming, the pacesetter in gas turbine engine technology. We're changing to meet the challenge of new products, new markets and new customers.

We offer outstanding growth opportunities to results-oriented information systems professionals looking for a dynamic and demanding work environment. The successful candidates will have extensive experience, proven track records of solid accomplishment, possess outstanding communication skills, and be catalytic and aggressive in nature.

THE OPPORTUNITIES

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Manager Systems Development

Manager Business Systems
Supervisors Business Systems Design
Business Systems Project Leaders
Business Systems Analysts

Manager Computer Aided Design, Manufacturing and Test (CAD/M/T)
Supervisors CAD/M/T Systems Design
CAD/M/T Systems Project Leaders
CAD/M/T Systems Analysts

Supervisor Advanced Systems Planning
Supervisor Decision Support
Supervisor Data Integrity

Technical Services, Operations and Communications

Manager Technical Services, Operations and Communications
Consulting Systems Programmers
Supervisor Data Base Administration
Supervisor Office Automation

Office Services

Manager Office Services

THE ENVIRONMENT

Our newly formed Information Systems and Services department is chartered to support our dramatic business growth. Our environment includes an IBM 3033UP, MVS/SE2, JES2, plus terminal networks under TSO and CICS. We're moving to IMS DB/DC. Programming languages include COBOL, FORTRAN, PL/1, BAL, RPG, DYL/260, RAMIS, GPSS, CSMP and APT/AC. IBM 3033 links to DEC 11/70 Unigraphics Design System, numerous Data Acquisition Systems for real time engine testing and IBM 8100's for inventory applications and shop floor communications.

THE COMPANY

Lycoming offers competitive salaries, growth opportunities, a superb benefit package and periodic cost of living adjustments.

To explore these outstanding career opportunities, in confidence, submit resumes and salary requirements to George Renker, Personnel, Avco Lycoming, 550 South Main Street, Stratford, CT 06497.

AVCO LYCOMING
an affirmative action employer

THE FUTURE IS OURS..MAKE IT YOURS TOO!

DALLAS

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CICS DOS BUS. APPS	$25,000
DOS/VS, EDOS, IDMS	$25,000
IMS, OS, COBOL	$30,000
DOS/VS, CICS, DL-1	$27,000
DOS/COBOL	$22,000
APL	$30,000
CICS Business Applications	$35,000
SOFTWARE	
DOS/MVS/VM	$35,000
IMS Internals	$35,000
MVS Internals	$35,000
Communications-IBM OS	$27,000
Univac 1100, Exec	$28,000
IMS Overseas	Open
OS Overseas	Open
Univac, DMS 1100	$36,000
MINI'S	
System 34 RPG II	$22,000
System 34 RPG II	$20,000
System 34 RPG II	Open
TI 990 Manager	$30,000
Data Point-Databus	$25,000
Data Point-Databus	$35,000
HP 3000-COBOL	$22,000

CONTACT: John Staiger
ROBERT HALF
OF DALLAS, INC (214) 363 3300
Two NorthPark East Suite # 750
Dallas Texas 75231

FLORIDA SYSTEMS PROGRAMMERS

LARGE, MODERN, TECHNICALLY SOPHISTICATED CLIENTS located in the SUNSHINE STATE have requirements for OPERATING SYSTEMS SOFTWARE SPECIALISTS in the areas of DATA COMMUNICATIONS or COMPUTER PERFORMANCE MEASUREMENT or OPERATING SYSTEMS SUPPORT. Experience with IBM, DOS/VS or MVS or VM/370 or IMS or CICS or VTAM or 3705 and ASSEMBLY LANGUAGE are desireable. Please Submit RESUME or CALL (to 8 PM EST):

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You will apply your PDP-10/11 sofware experience to enhance the quality of hardware diagnosis capabilities and provide analytical analysis of failures to isolate system faults.

An indepth knowledge of TOPS-10 or TOPS-20 operating system internals, coupled with conceptual knowledge of hardware operation, is required. Strong interpersonal skills essential.

For more information, Call Carson Janes at 415/794-2416, or send your resume in confidence to Tymshare, 3300 Capitol Ave., Fremont, CA 95438, Attn: Carson Janes.

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COMPUTER SYSTEMS & SUPPORT
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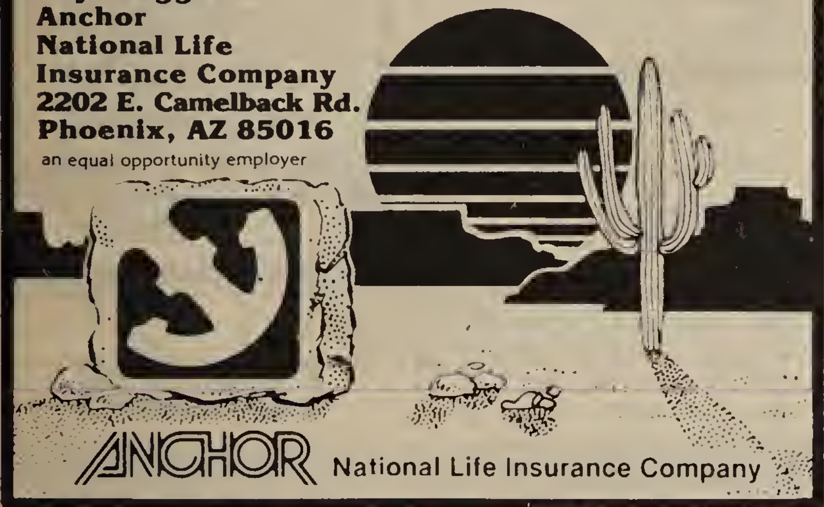

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Both positions require thorough knowledge of COBOL, IBM JCL, BAL, OS Utilities, TSO/SPF. Knowledge of Librarian, RACF and UCC1-TMS are a plus.

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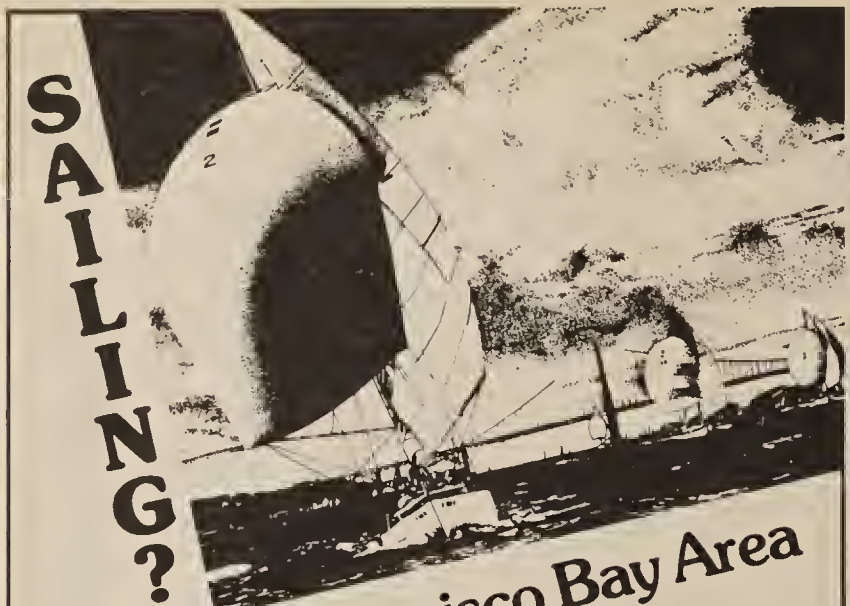

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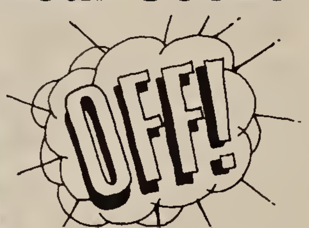

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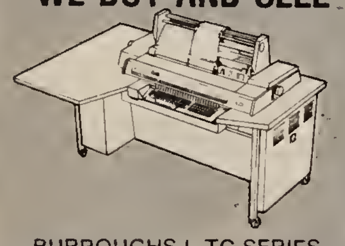

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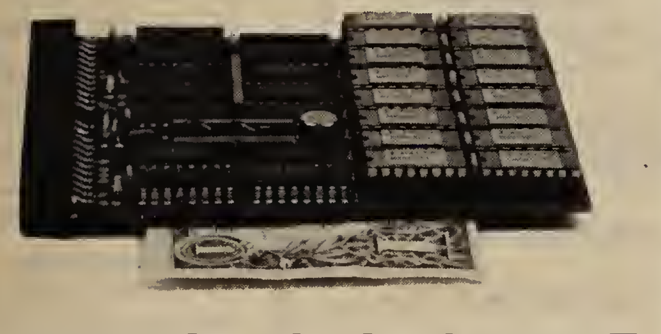

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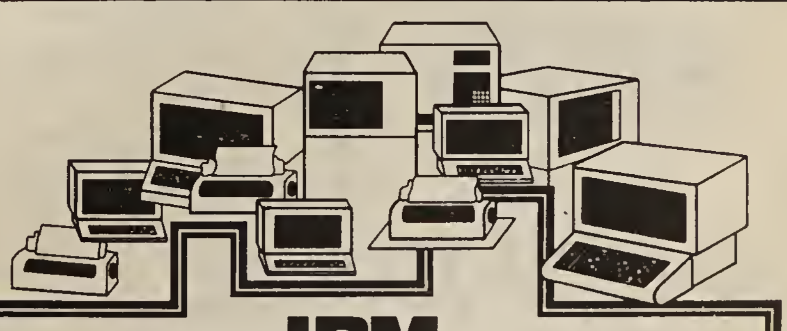

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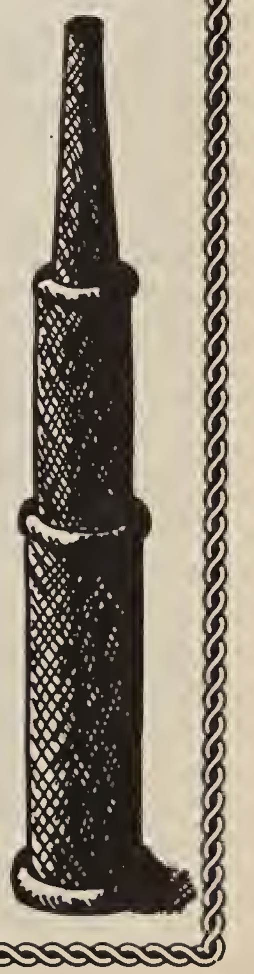

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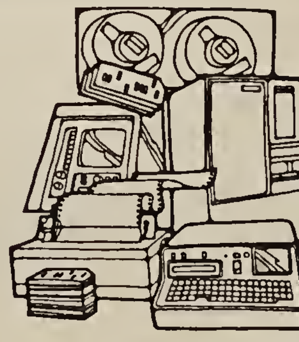

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Axios 50

Glenn A. Barber & Associates 16
John Beall 59
Beehive International 18
Brum-Ko Magnetic Corp. ID/10
BTI Computer Systems 22-23

City of Davis 19
Comdata 57
ComDesign 72
Commodore Business Machines 68
Communication Networks ID/14
Computer Leasing Corp. 34
Computer Management Research 23
Computer Parts Exchange 16
Computer Power Products 29
Computer & Terminal Exchange 61
Cullinane Database Systems, Inc. ID/15
CW Broadcasting 32, 81
CW International ID/6

Data General 20-21
Dataproducts 60
Dexel Leasing Corp. 80
Digital Associates 35
Digital Equipment Corp./npm 78-79
Dorlen Products 28

Electronic Data Systems ID/5
Enterprise Information Systems 13, 14-15

General Electric/Terminet 49
General Electric Tube 80

Hewlett Packard 70-71

IBM/GSD 54-55
ICCP 76
Infodata 66
Information Concepts, Inc. 4, 6
Innovation Data Processing 7
Intel Corp. Systems Group 62-63
Intelmatique ID/16
Invitational Computer Conference ID/10

Johnson Systems, Inc. 45

Lear Siegler 36-37
Lexitron 10

Macmillan Books 65
Management Science America 51
Marathon Oil Co. 48
Martin Marietta Data Systems 48, 74
Memorex 114
Micro Management 32
Mini Computer Business Applications 72
Monosson on DEC 60
MSD 56
MSRA, Inc. 14
Mike Murach & Assoc. 9

Newman Computer Exchange, Inc. 15, 62

OEM Business Forum ID/12-ID/13
O'Neil Data Systems 75
Orion Industries 76

Para Research 11
Performance Systems 49
Pergammon Infotech 24
Power Distribution 50
Prime Computer ID/8-ID/9
Protocol Computers ID/3

Qwikterm 6

Raytheon Data Systems 19

Scientific Data Systems 10
SDI ID/11
Software International 31
Sorbus 44
Storage Technology 46-47
Syncom 30
el3
Technalysis 53
Technology Transfer Institute 43, 73
Teldata Systems Corp. 56
Televideo Systems 38-39
Telex Computer Products, Inc. ID/7
Texas Instruments ID/2
Texprint 76
Tone Software 10, 50
Toshiba 77

Unit Record Service Co., Inc. 30
University Computing Co. 25-27

Visual Technology 58

Westwood Associates 30
John Wiley & Sons 52
Wolfe Computer Aptitude Testing 22

Xerox/Computer Service Div. 12

Yourdon 5

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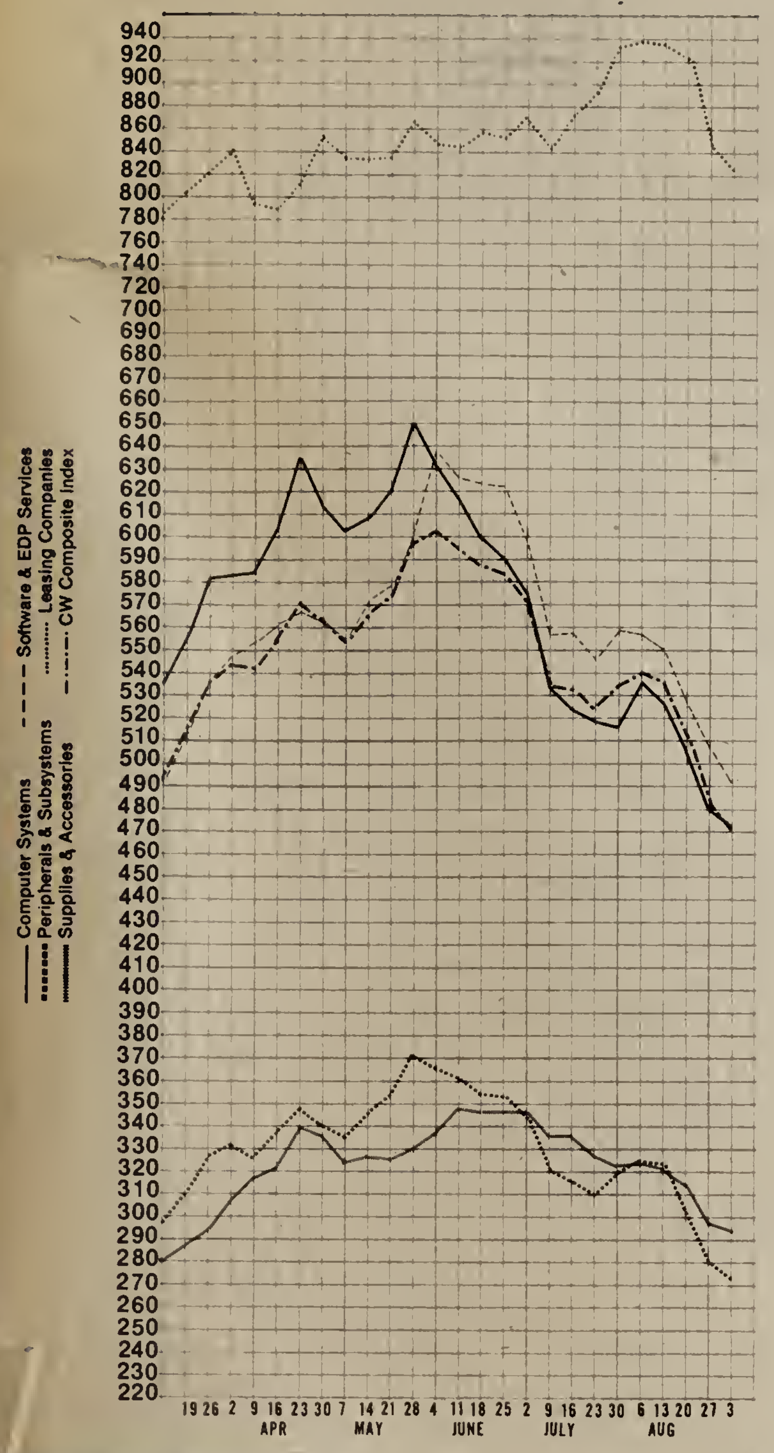

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CLOSING PRICES WEDNESDAY, SEPTEMBER 2, 1981

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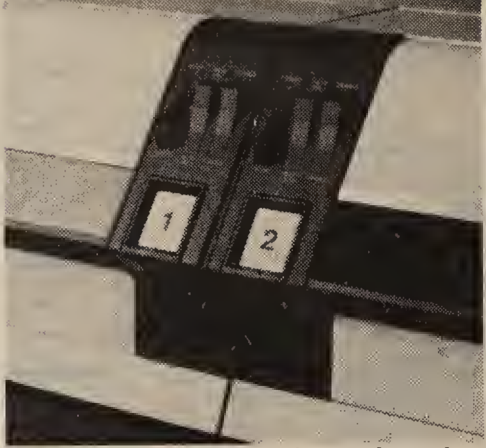
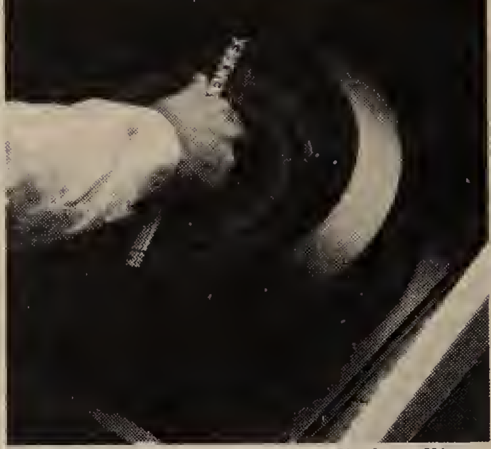
EXCH		PRICE			
		1980-81 RANGE (1)	CLOSE SEPT 2 1981	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	23- 46	30 7/8	+ 3/8	+1.2
N	BURROUGHS CORP	34- 72	34	-1 3/8	-3.8
O	COMPUTER AUTOMATION	10- 28	12 3/4	+2 1/4	+21.4
N	CONTROL DATA CORP	60- 84	68	+ 1/4	+0.3
N	CRAY RESEARCH INC	29- 49	31 3/8	+2 1/8	+7.2
N	DATA GENERAL CORP	45- 87	45 1/8	-4 7/8	-9.7
N	DATAPOINT CORP	43- 68	46 1/4	0	0.0
N	DIGITAL EQUIPMENT	80-113	91 5/8	- 1/8	-0.1
A	EECO INC	9- 19	8 3/4	-1 1/8	-11.3
N	ELECTRONIC ASSOC.	6- 13	6 1/4	- 1/4	-3.8
N	FOUR-PHASE SYSTEMS	18- 46	31 3/8	- 3/8	-1.1
N	FOXBORO	46- 62	47 1/4	-2 5/8	-5.2
O	GENERAL AUTOMATION	7- 16	9 5/8	- 3/8	-3.7
O	GRI COMPUTER CORP	1- 3	1 1/4	0	0.0
N	HARRIS CORP	39- 60	39 7/8	-3 1/8	-7.2
N	HEWLETT-PACKARD CO	33- 54	44	0	0.0
N	HONEYWELL INC	82-115	85	-3 1/8	-3.5
N	IBM	55- 73	55 3/4	+ 1/4	+0.4
O	MAGNUSON COMP SYSTS	16- 32	16 3/4	+1 1/4	+8.0
N	MANAGEMENT ASSIST	11- 26	12	- 1/8	-1.0
O	MINI-COMPUTER SYST	1- 4	1 3/8	- 1/4	-15.3
N	MODULAR COMPUTER SYS	8- 32	8 3/8	- 1/4	-2.8
N	MOHAWK DATA SCI	13- 32	13	-3 3/8	-20.6
N	NCR	55- 76	54 1/2	- 7/8	-1.5
N	PRIME COMPUTER INC	22- 49	22 3/4	- 3/8	-1.6
N	PERKIN-ELMER	22- 36	22 7/8	- 1/4	-1.0
N	SPERRY CORP	34- 65	35	-1 3/4	-4.7
O	TANDEM COMPUTERS INC	13- 35	29 3/4	+2	+7.2
N	TEXAS INSTRUMENTS	85-151	85	-1	-1.1
A	WANG LABS.	24- 46	26	+1 3/4	+7.2
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	18- 29	26 1/4	-1 1/4	-4.5
N	COMDISCO INC	17- 24	17	- 3/8	-2.1
O	COMMERCE GROUP CORP	1- 2	7/8	- 1/8	-12.5
O	COMPUTER INVSTRS GRP	1- 4	5/8	0	0.0
O	CONTINENTAL INFO SYS	4- 9	6 1/4	- 3/4	-10.7
A	DCL INC	3- 4	3 1/4	0	0.0
N	DPF INC	5- 12	9 3/4	+ 1/8	+1.2
O	ITEL	1- 15	3/4	0	0.0
O	LEASPAC CORP	1- 2	3/8	0	0.0
A	PIONEER TEX CORP	2- 6	3 5/8	0	0.0
N	RELIANCE GROUP INC	65- 99	86 1/4	- 1/2	-0.5
N	U.S. LEASING	18- 30	21 1/2	- 1/2	-2.2
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	3- 8	3 3/4	- 3/4	-16.6
O	ADVANCED SYSTEMS INC	10- 15	11 3/4	0	0.0
O	ANACOMP INC	13- 18	14 1/4	- 1/2	-3.3
O	ANALYSTS INTL CORP	3- 14	5 1/2	- 1/4	-4.3
A	APPLIED DATA RES.	15- 25	15 3/8	- 5/8	-3.9
N	AUTOMATIC DATA PROC	22- 32	27	-1 3/8	-4.8
O	CGA COMPUTER ASSOC	6- 25	6	- 1/2	-7.8
O	COMPUTER HORIZONS	1- 5	2	- 3/4	-27.2
O	COMPUTER NETWORK	4- 8	4 3/4	+ 1/4	+5.5
N	COMPUTER SCIENCES	16- 30	17	0	0.0
O	COMPUTER TASK GROUP	13- 23	16	- 3/4	-4.4
O	COMPUTER USAGE	3- 10	3	+ 1/8	+4.3
O	COMSHARE	10- 21	8 1/2	- 1/4	-2.5
O	CULLINANE DATABASE	29- 88	51 1/2	+1	+1.8
O	DATA DIMENSIONS INC	1- 4	3/4	- 1/4	-27.7
O	DATATAB	2- 4	2 1/4	0	0.0
O	DSI CORP	4- 8	5 3/8	- 1/2	-8.5
O	DYATRON CORP	5- 11	5 1/2	0	0.0
N	ELECTRONIC DATA SYST	15- 30	23 5/8	-1 5/8	-6.4
O	INFORMATICS INC	17- 34	21 1/4	+1 1/4	+6.2
O	INSYTE CORP	1- 3	2 3/8	- 1/8	-5.0
O	IPS COMPUTER MARKET.	1- 4	1 3/4	0	0.0
O	KEANE ASSOCIATES	4- 8	5 3/4	- 1/4	-4.1
A	LOGICON	23- 38	28 3/4	-2	-6.5
O	MNGT SCI AMER INC	17- 26	18 1/4	- 1/2	-2.6
O	MATHEMATICA INC	12- 19	14 1/2	+ 3/4	+5.4
O	MATHEMATICAL APP GRP	15- 28	19 1/2	+ 1/2	+2.6
O	NATIONAL DATA CORP	14- 28	17 7/8	- 1/4	-1.3
N	PLANNING RESEARCH	6- 13	5 1/2	- 1/4	-4.3
O	PROGRAMMING & SYS	1- 2	1 1/2	- 1/8	-7.6
O	RAPIDATA INC	5- 11	5 1/2	- 1/2	-8.3
O	REYNOLDS & REYNOLD	18- 26	18 1/2	- 1/4	-1.3
O	SEI CORP	17- 28	22 1/2	+ 1/4	+1.1
O	STSC INC	9- 28	9 3/4	+ 1/2	+5.4
O	SCIENTIFIC COMPUTERS	8- 16	9	0	0.0
O	SOFTWARE AG	15- 23	16 3/4	+2 1/4	+15.5
N	TYMSHARE INC	33- 58	33 1/2	- 7/8	-2.5
A	URS CORP	13- 18	12 5/8	- 1/4	-1.9
N	WYLY CORP	9- 20	9	- 3/8	-4.0
	PERIPHERALS & SUBSYSTEMS				
N	AM INTERNATIONAL	11- 25	10 7/8	-1 3/8	-11.2
A	ANDERSON JACOBSON	13- 26	13 1/4	-1 1/2	-10.1
O	AUTO-TROL TECHNOLOGY	11- 62	11 3/4	+ 1/4	+2.1
O	BEEHIVE INT'L	10- 18	9 1/2	- 1/4	-2.5
A	BOLT,BERANEK & NEW	13- 25	13 1/4	-3 1/4	-19.6
O	CAMBEX CORP	2- 9	3 3/4	- 1/8	-3.2
N	CENTRONICS DATA COMP	7- 40	7 3/8	-1	-11.9
A	CETEC CORP	4- 9	4 1/2	- 1/2	-10.0
O	COMPUTER DEVICES INC	6- 10	6 1/4	- 3/8	-5.6
O	COGNITRONICS	5- 11	6 1/8	- 1/2	-7.5
O	COMPUTER COMMUN.	1- 8	1 1/8	-	-4.9
A	COMPUTER CONSOLES	20- 28	22 3/8	+ 1/4	+1.1
O	COMPUTER TRANSCEIVER	3- 9	7 1/2	- 1/2	-6.2
N	COMPUTERVISION CORP	20- 49	33	-4	-10.8
N	CONRAC CORP	17- 28	22 7/8	- 1/4	-1.0
A	DATA ACCESS SYSTEMS	6- 23	7	+ 1/2	+7.6
A	DATAPRODUCTS CORP	24- 44	25	+ 5/8	+2.5
O	DATUM INC	2- 5	1 7/8	- 1/8	-6.2
O	DECISION DATA COMPUT	3- 6	3	0	0.0
O	DELTA DATA SYSTEMS	2- 4	3	+ 1/8	+4.3
O	DATARAM CORP	6- 15	6 1/8	+ 1/8	+2.0
N	ELECTRONIC M & M	4- 9	4 1/8	0	0.0
O	EVANS & SUTHERLAND	18- 40	29	+1 1/2	+5.4
O	FABRI-TEK	2- 6	3 3/8	- 3/8	-10.0
O	GENERAL COMPUTER SYS	1- 12	7 1/4	- 1/2	-6.4
N	GEN'L DATA COMM IND	10- 19	9 7/8	- 3/8	-3.6
O	GENERAL TERMINAL CP	1- 4	1	0	0.0
N	HAZELTINE CORP	20- 35	23	- 7/8	-3.6
O	INFORMATION INTL INC	8- 17	11 1/4	+ 1/2	+4.6
O	INTEL CORP	28- 51	28	- 1/2	-1.7
O	IPL SYSTEMS INC	9- 15	8 3/4	- 3/4	-7.8
A	LUNDY ELECTRONICS	9- 18	9 3/4	-1	-9.3
A	MSI DATA CORP	11- 27	15 3/8	- 1/4	-1.5
N	MEMOREX	8- 18	11 7/8	- 1/8	-1.0
O	NETWORK SYSTEMS CORP	17- 25	17 1/4	0	0.0
O	OMEX	2- 12	12	0	0.0
N	PARADYNE CORP	25- 52	36 1/2	-1 3/4	-4.5
A	PENRIL CORP	10- 17	10 3/8	- 1/8	-1.1
O	RAMTEK CORP	10- 23	11 7/8	-1 1/2	-11.2
N	RECOGNITION EQUIP	8- 21	7 1/2	-1	-11.7
O	SCAN DATA	1- 5	1 3/4	0	0.0
N	STORAGE TECHNOLOGY	18- 36	32 7/8	+2 3/8	+7.7
O	SYKES DATATRONICS	8- 29	19 1/2	+ 1/4	+1.2
A	T BAR INC	12- 19	13	+ 1/2	+4.0
A	TEC INC	4- 7	4 3/8	- 3/8	-7.8
N	TEKTRONIX INC	46- 70	46 1/2	-1 5/8	-3.3
N	TELEX	5- 9	5 1/2	+ 1/8	+2.3
O	TESDATA SYSTEMS CP	8- 17	8 1/4	+ 3/8	+4.7
A	TIMEPLEX INC	10- 19	10 1/4	- 3/4	-6.8
O	WILTEK INC	1- 3	1 3/4	+ 1/8	+7.6
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	12- 17	12 1/4	0	0.0
O	BALTIMORE BUS FORMS	1- 2	3/4	- 1/8	-14.2
N	BARRY WRIGHT	16- 24	17 3/8	- 1/4	-1.4
O	CYBERMATICS INC	1- 2	1	- 1/8	-11.1
A	DUPLEX PRODUCTS INC	12- 17	14	+ 1/8	+0.9
N	ENNIS BUS. FORMS	15- 23	17 3/4	-1	-5.3
N	3M COMPANY	50- 65	51 5/8	+1 1/8	+2.2
O	MOORE CORP LTD	27- 38	32 7/8	+ 7/8	+2.7
N	NASHUA CORP	18- 33	19	- 1/4	-1.2
O	STANDARD REGISTER	30- 41	34 3/4	0	0.0
A	TAB PRODUCTS CO	16- 30	17 5/8	- 1/4	-1.3
N	WALLACE BUS FORMS	22- 31	28 1/2	+2 1/2	+9.6

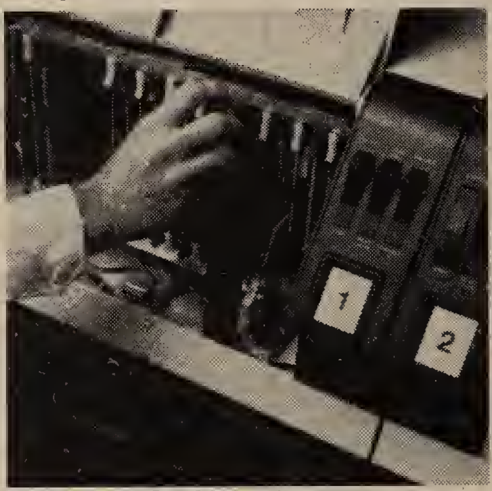
EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

BETTER.


Attractive, uncomplicated control panel.


Low-profile design for easy media handling.

Energy and space-efficient design.


Convenient, flexible service access.

The product is the 3330 compatible Memorex 3670/75 Disc Storage Subsystem. And, for people looking to attach large, direct access storage devices to System 370 and other compatible computers–people with removable storage requirements–there is simply no better word to describe our product than the word "better." Because, for any number of reasons, the 3670/75 is better than the competition. And, with several Memorex enhancements, this subsystem is even better than our own original offering.

The 3670/75 Delivers Better Performance. Because we designed it to exceed all competitive performance standards. For example, our advanced dual port concept, Intelligent Dual Interface, resolves contention at the spindle rather than the string or CPU level, freeing the computer to work on important programs. Multiple Channel and String Switching improves data accessibility and configuration flexibility by allowing access by alternate channels or control units. In fact, the 3670/75 boasts an average access time of only 27 m/sec, 10% better than the competition.

The 3670/75 Offers Better Reliability. Because it's built better to last longer. With Memorex exclusive ferrite heads that fly higher and are more sensitive. With a Memorex-patented air flow system that reduces the risk of thermal shutdown and disc contamination. With more efficient monitoring and control circuitry. With a Fault Isolation Diagnostic System that detects failing components. And with micro-diagnostics that isolate failures without CPU involvement. Add the advantages of Memorex media, especially the new, standard-setting M Formula discs with superior magnetic properties, and the best subsystem gets even better.

The 3670/75, With Better Human-Engineering. The 3670/75 drives require 5% less power/cooling and take up 25% less floor space than competing drives, which means cost savings to you. Their low-profile design makes it easier to load and unload disc packs, and unlike the high stacked design of the 3330, the Memorex 3670/75 drives can be placed anywhere in your computer room without blocking views, enhancing the work environment. And since we're talking "better," just take a look at the 3670/75–it's better-looking, too.

Little wonder, then, that there are many thousands of 3670/75s up and running worldwide. Better performance, reliability, efficiency and design. Better yet, available in quantity, right now. Contact your local Memorex representative for details, or Ron Rogers, Memorex Storage Equipment, San Tomas at Central Expressway, Santa Clara, CA 95052, (408) 987-1386.

MEMOREX

For twenty years, the expression of excellence.